JAN LEWIS: DOES YOUR COMPANY NEED DESKTOP PUBLISHING?★

California's Computer Magazine

JULY 1987 • ISSUE 33

FREE

MICROTIMES

DVORAK!!

The World According To John Dvorak

SPECIAL SECTION: COMPUTERS AND MUSIC

- Todd Rundgren Interview
- Passport Designs—Software For The Musician
- Macintosh And MIDI
- Music On The Amiga

Blackship Supports Fertility Rites on Desktop

OYSTER POINT. "Yoo-hoo, Mr. Blackship, we're back!" Turning, Blackship waved away the smoke of his Cuban cigar and recognized Mabel, her faithful Harold close behind.

"A pleasant surprise," bowed Blackship. "And how was your expedition through the jungles of Borneo?"

"Land sakes," she laughed. "Once we ditched the guide, it was a real trip. We'll leave for the Hebrides as soon as we can wade through the annual report and finish our yearly newsletter."

"Desktop publishing," nodded Blackship. "Well, you've got a good start with the Blackship system."

"And Harold is giving me the HP LaserJet Series II printer for my birthday. What a romantic!"

Blackship laughed. "With Ventura software for only $599, you're in business."

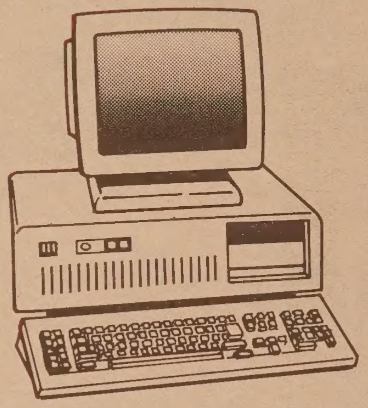
"Maybe," complained Harold. "But who can afford the scanner to handle all these photos?"

"No problem," smiled their friend. "When you buy hardware from Blackship, you get free use of our scanner."

"See, Harold," said Mabel. "I told you Blackship would take care of us and help improve our image."

"Maybe, Sweetums, but just wait 'til our friends get a load of us in that fertility rite."

AT* COMPATIBLE SYSTEMS



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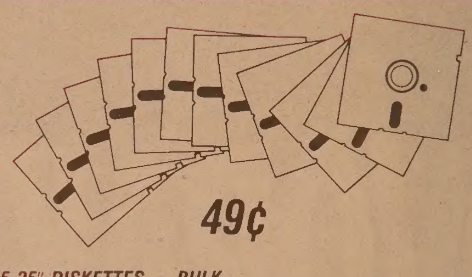

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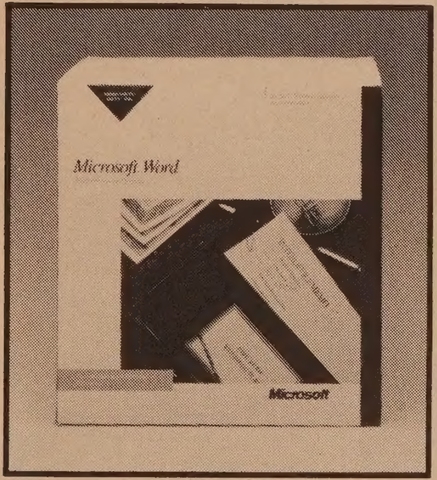

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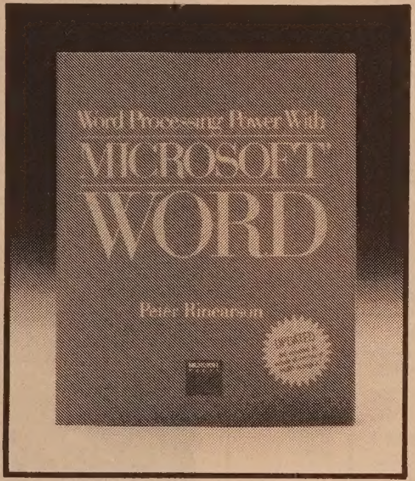

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MICROTIMES

HANDS ON

70 Life With A Macintosh SE

By Jim Wolcott
Apple's new standard business machine offers more power, an expansion slot — and a few changes from the Mac Plus that may take some getting used to.

COLUMNS

78 Data Base Management

By Warren Sirota
Relational Report Writer, a report generator for *dBASE III* files.

82 PC Systems

By Ken Milburn
An analysis of IBM's new PS/2 computer line and its implications for the future.

84 Amiga/Commodore

By Matthew Leeds
A mixed bag of new products for the Amiga, C64, and C128.

88 Atari ST

By Helmi Kobler
Desktop publishing on the ST.

90 Telecommunications

By Brock N. Meeks
A comparison of four leading electronic mail services.

28 The Industry According To Dvorak

By Mary Eisenhart

Arguably the industry's most widely-read columnist, John Dvorak is an outspoken advocate of user-useful products and a scathing detractor of those that don't meet his exacting standards. In this month's cover story he holds forth on the state of personal computing — what's right, what's not so right — in his customarily candid manner.

COVER STORY

COVER AND CONTENTS PHOTOS: JIM MARSHALL

John Dvorak maintains a healthy cynicism in his views on the industry. See page 28

SPECIAL SECTION

Computers & Music

36 Todd Rundgren: Connecting Artist And Machine

By Charles Bermant and Mary Eisenhart
Musician, artist, and hacker, Todd Rundgren pioneered musical applications of personal computers well before the advent of MIDI. In addition to his musical work, he's currently involved in designing better user interfaces for graphics applications in order to provide artists with more efficient, intuitive tools. Here he talks about his preferences in currently available equipment, the changes personal computers have wrought in the music industry, and what the technology still needs to accomplish.

Todd Rundgren discusses the artist-friendly interface. See page 36

PHOTO: JIM MARSHALL

54 MIDI And The Macintosh: The Musician's Workstation

By Paul Craner
MIDI technology and the Macintosh computer give the professional or amateur musician the tools that used to be the exclusive property of the super-rich superstar. Here's how you can put this system to work.

63 Passport Designs And The Evolution Of MIDI For Micros

By Kristen R. Coston
Based in Half Moon Bay, Passport Designs was one of the earliest trailblazers in the computer music field with the Apple II program *Soundchaser*. Since then they've become a leader in the MIDI arena and now offer a wide range of music products for a variety of machines.

66 Music On The Amiga

By Ben and Jean Means
The Amiga's sophisticated music capabilities, along with its powerful multitasking features, make the machine a natural for music and video applications. This article profiles some of the leading music packages currently available for the Amiga.

DEPARTMENTS

8 But Jan Lewis Says...

Does your company need desktop publishing? Jan offers suggestions and criteria to help you make an informed decision.

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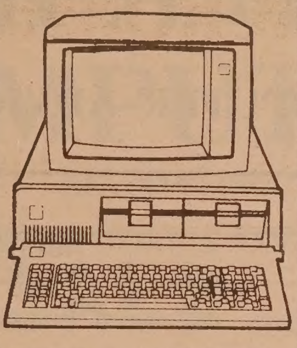

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JULY , 1987 VOLUME VI NUMBER 1

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◆

The New I.B.M.'s -Vs- Apple's Macintosh

With I.B.M.'s new machines available now, (not the 386) it seems obvious that the race for a more friendly operating enviornment is on. Is it possible that the new I.B.M. computers might be a viable contender in the world of graphics to that of the already existing graphics orientated Apple Macintosh. With I.B.M.'s lack of the proper operating system necessary to support such long awaited things such as a graphics interface, more memory management, and multitasking-multiuser operations, one might be lead to believe that with out it Apple has a good lead.

Making a Choice?

Which of these two major computer manufactuers makes the computer that is the right one for you? The first thing to think about is the type of applications that you will need to use the computer for and then make sure that software is available that meets your requirements. Secondly, how much of your time can you afford to donate towards the learning of the system (if you don't already know how). Oh, and of course price is also a major consideration.

◆

Laser Printers

As the number of laser printers in the marketplace continues to grow on a weekly basis which of the lasers is best for you?

For the PC user the choice is a little more difficult due to the lack of any standard format used by in laser printers. If you need to be able to run many different types of applications, chances are not every package will output to a laser printer and even if they do one package might know the type of laser your using and one might not.. If this is the case then you must look for a laser that can emulate one of the more popular printers on the market such as an Epson, Diablo,. If you are only running certian packages or specializing in one particular area then you must choose a laser that is compatible with the particular software that you will be using.

For the Macintosh user the choice is a little less complex, you must get a laser that is Postscipt driven (since all software written for the Mac uses this output language). There are several manufactuers of this type of laser one being Apple with its Laserwriter and a growing number of other companies are now offering their lasers with this typographical language built in, one worth mentioning is the QMS PS800.

With all the available lasers on the market making the right choice can be a difficult thing to do. The most important thing (more for PC users than Mac) is to choose your laser to match your softwares output needs and not to choose a laser before you have established your software. needs.

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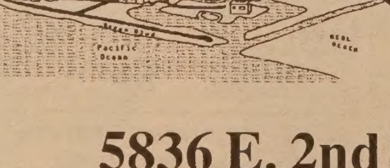

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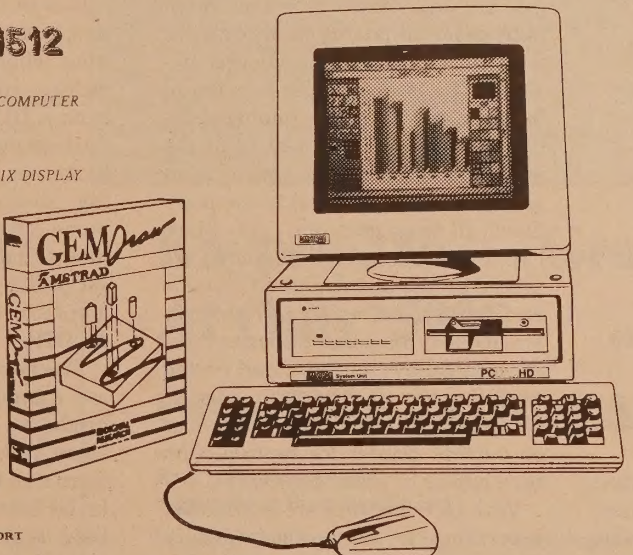

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BUT JAN LEWIS SAYS . . .

Does Your Company Need Desktop Publishing?

A question we're frequently asked is, "How do I gain control over my document production process?" Managers are tired of time wasted in the typesetting-and-printing turnaround loop. And they're being eaten alive by the costs of turning out quality documents through traditional production channels.

Think about the materials you need printed regularly and in a timely fashion: reports, manuals, catalogs, newsletters, directories, brochures, sales presentations, etc. A sizable chunk. Now think about your budget and where professional typesetters and printers fit in. Another sizable chunk.

If you produce or purchase forms, newsletters, brochures, reports, product packaging, direct mail pieces, advertisements, flyers, or any other documents that require professional typeset quality or that combine text with graphics, then you are a candidate for DTP.

How can you make these mountains into molehills? If the secret word hasn't occurred to you yet, here's a clue: DTP. Yes, you too can have your own mom-and-pop print shop. Desktop Publishing is an easy-to-learn, low-cost method for producing professional-quality documents in-house.

DTP is the latest step in the evolution of business publishing. When many businesses changed from using typewriters to word processors, they thought all their problems were solved. But although word processors allow documents to be changed easily and quickly, they offer little in the way of page design or the possibility of merging text with graphics. By comparing the preparation of a DTP document to the steps a document traditionally goes through before being printed, you can better understand the advantages of DTP.

Production of a traditionally prepared document begins with writing text. Whether prepared on a typewriter or word processor, the text is preprinted and then taken to a typesetter. There, the copy is keyed into typesetting machines that print it out on long sheets of paper, called galleys. A paste-up artist cuts up the galleys, and pastes or waxes them onto paste-up boards in accordance with instructions from whoever designed the layout. If graphics are to be included, they are photographically enlarged or reduced to fit the available space. The reproduced graphics are then added to the page. Once all text, graphics, rule lines, captions, and other elements are placed on the board, a proof is made and sent for corrections. If changes are needed, the corrections are typeset into galleys, cut out, and pasted over the errors. After the page is completed, it is sent to an in-house or outside printer for reproduction on a copier or offset printer.

With DTP the steps are similar, but everything is done electronically. The copy is typed into a word processing package that's compatible with the DTP software, then stored on disk. The DTP software is then used to electronically place the word processing file on a page or several pages. It is here that the user can determine the number and width of columns, whether a story runs on one page or jumps onto others, the number of pages, placement of rule lines and graphics, etc.

Graphics stored on disk can also be added. Cropping, enlargement, or reduction of graphics can be done in the DTP system. Corrections also can be done right on the computer screen. Even major edits like changing type size or rearranging paragraphs can be easily accomplished.

Once the page is complete, the user selects the print command and the software "sends" the document to a laser printer. In a few moments, the printer outputs a document complete with text and graphics.

Obviously, the DTP process offers quicker turnaround time, more control over the production process, and elimination of typesetting bills. But is it right for your business? The best way to answer that question is to ask yourself some basic questions about the kind of documents you produce or use on a regular basis, the need to make last-minute changes to your documents, and required turnaround time. Also give some thought to who will be using and learning the DTP system. Last, but not least, can you afford it?

If most of your documents are letters, memos, or internal communications where typewritten text is satisfactory, you probably won't benefit from a DTP system. But if you produce or purchase forms, newsletters, brochures, reports, product packaging, direct mail pieces, advertisements, flyers, or any other documents that require professional typeset quality or that combine text with graphics, then you are a candidate for DTP.

The beauty of DTP is that changes are a snap. For example, say you produce a product catalog for a trade show. A week before the show you learn that the prices of 50 items need to be increased. If the catalog had been sent to an outside typesetter, chances are that these changes would take several days, causing you to miss the trade show. (Your only alternative would be to settle for a typed, photocopied errata sheet stapled to the catalog cover or tucked inside and easily lost.) With DTP, however, you can make the changes in usually less than an hour.

If you ever had to settle for a typewritten document because your printer couldn't turn the job around fast enough, DTP could be the solution you've been looking for. In most cases, a document produced with DTP takes significantly less time than one sent out of house.

If you ever had to settle for a typewritten document because your printer couldn't turn the job around fast enough, DTP could be the solution you've been looking for. In most cases, a document produced with DTP takes significantly less time than one sent out of house.

However, if you currently send your documents out to be typeset and pasted up, you may pay a lot, have to wait a long time, and be unable to make changes, but at least you're not taking up your employees' time.

Before investing in DTP, you must decide if you can allocate personnel to document production. In a large company, you may need to add to your art or marketing staff or retrain people already in those departments. A small company may have to allocate part of a current employee's time to DTP. The amount of time or additional staff required will depend on the number and type of documents your company produces.

The price for a fairly powerful DTP system that includes a personal computer, laser printer, and software can start at around $9,000. Of course, if you already own an IBM-AT compatible personal computer or Apple Macintosh, you can build your system around it. Furthermore, some copy centers and typesetters are beginning to install laser printers and personal computers. If one of these companies is located near your office, you may be able to arrange to use its laser printer and save the cost of buying one.

When trying to cost-justify a DTP system, take into account your yearly bills for typesetting and paste-up, the times you've had to settle for less-than-perfect documents because of printer deadlines, and the high-quality documents you could be producing if you had the facilities in-house.

The DTP explosion really began

Jan Lewis is a well-known industry analyst and president of the Palo Alto Research Group, a consulting firm for the microcomputer industry. This article has been reprinted with permission from Computer Insider, *PARG's newsletter.*

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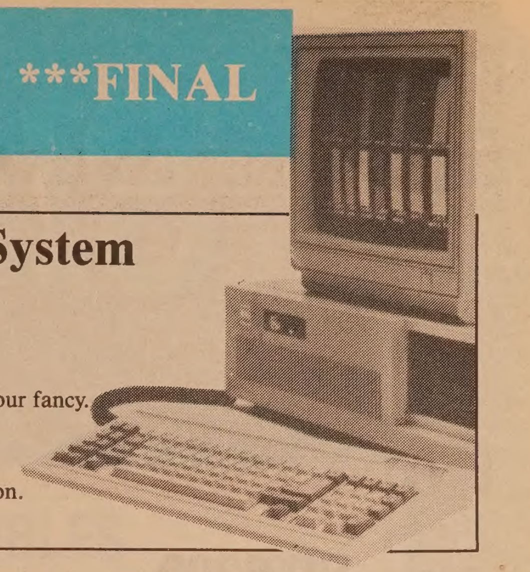

KAYPRO Announces Turnkey Desktop Publishing System Extra! Extra! Has Arrived

By K.C. Wilson
Computer Applications

Solana Beach—In a major announcement, designed to shake up the rest of the computing industry, Kaypro Corporation has announced its new turnkey desktop publishing system, entitled "Extra! Extra!", is now available for purchase. The system, available exclusively from **Computer Applications of Garden Grove, CA,** comes complete with everything you need to begin your own newsletter, magazine, or whatever tickles your fancy. (see accompanying story).

For other applications of this outstanding desktop publishing package, call Computer Applications at 714-891-2001 and ask to speak to reporter K.C. Wilson.

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Other systems with less retail for 10K or more

By Oli Thordarson
Computer Applications

Garden Grove—The outstandingly valued Kaypro Extra! Extra! Desktop Turnkey Publishing System is selling for just $8495 at the local Computer Applications computer store. Normally, similar packages sell for $10,000 or more, yet don't give you nearly the same features.

Included in your system are:

- Kaypro 286i Model C
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By I'll Take It
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By What A. Deal
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Kaypro 386 — Great Value At Only $5995

Power Users Can Now Afford The Best

By I. Cant Believeit
Applications Programmer

Southern California—Rocking the computing industry, Computer Applications of Garden Grove, CA has announced that now power users can afford the machine they've been waiting for, the KAYPRO 386. For just under 6 thousand dollars, the 386 comes with **60 MB Priam Hard Drive, EGA Monitor, Auto switch EGA card, and 512K memory (expandable).**

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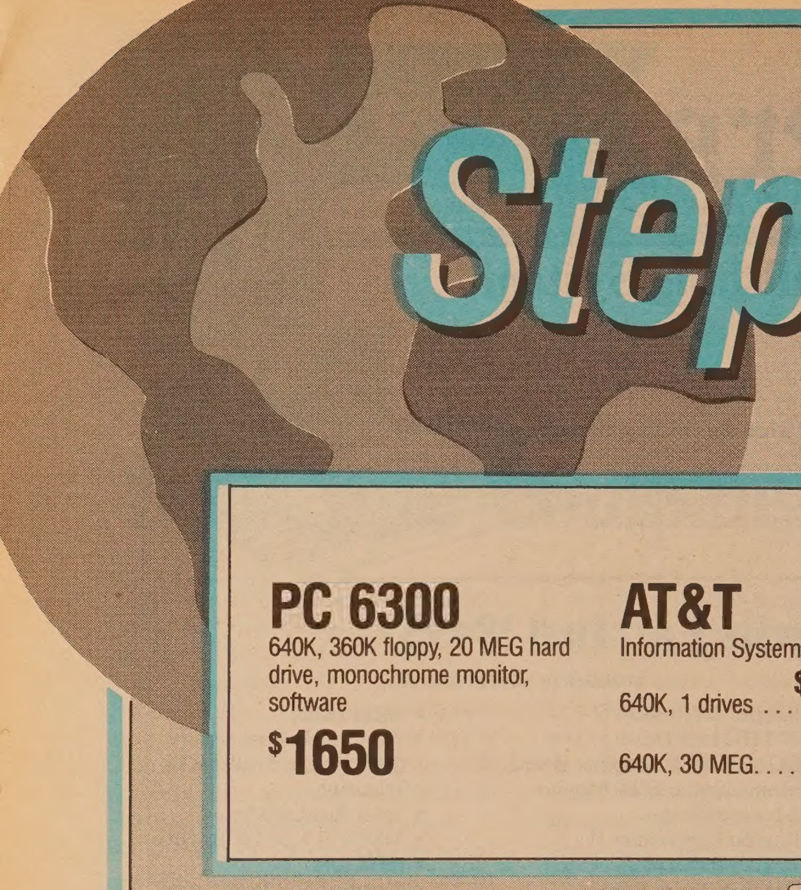
* For the first 90 days after purchase, Kaypro assures that any major IBM-compatible business software will run on the Kaypro PC or they will grant a trade-in credit toward the purchase of an IBM PC. Trade-in for IBM PC is available only through original Kaypro dealer and IBM suggested-retail price applies.



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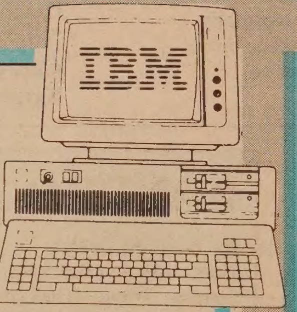

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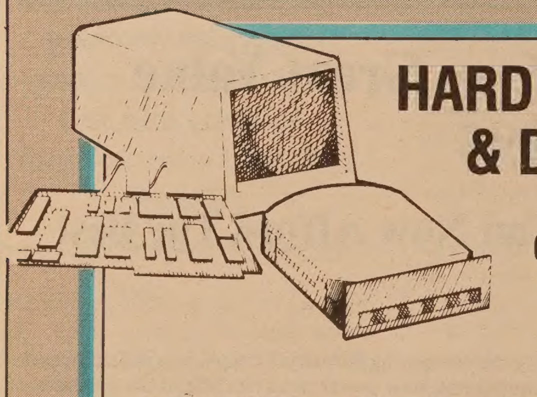

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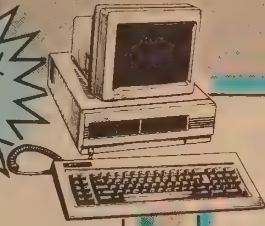

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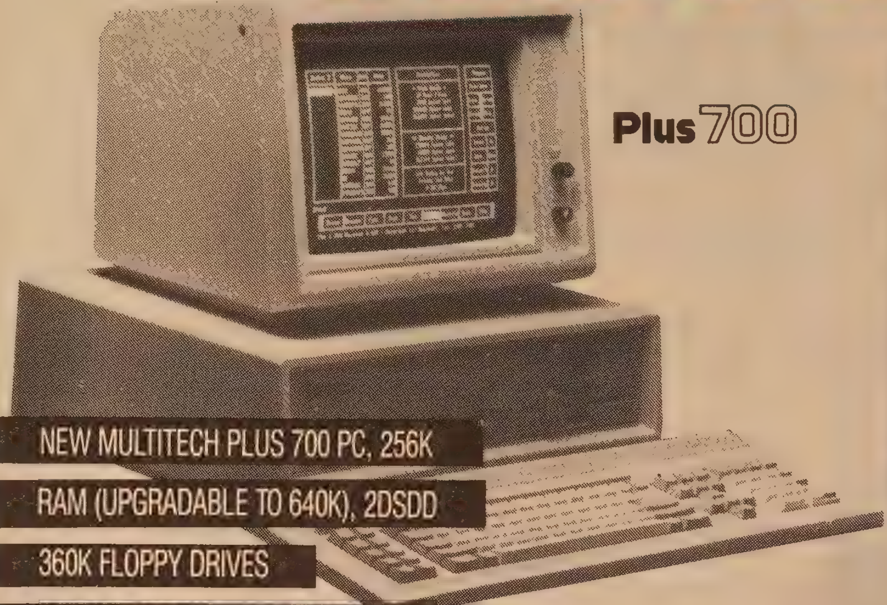

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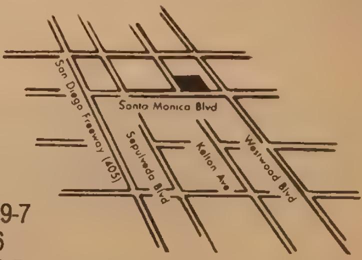

Hours: M-Th 9-7
Fri 9-6
Sat 10-5

with the introduction of three products: Apple's Macintosh personal computer, Apple's LaserWriter laser printer, and Aldus Corporation's *PageMaker* software for the Macintosh. Paul Brainerd, president of Aldus, coined the term "desktop publishing" to describe the use of personal computers to merge text and graphics for high-quality output. DTP is the electronic equivalent of typesetting and page composition.

A DTP system consists of hardware and software. The hardware required includes:

A personal computer. Apple was the first company to offer a low-cost personal computer that used a graphics environment suitable for DTP. Recently introduced DTP software, however, can run on a number of systems, including IBM and compatible personal computers.

A laser printer. This printer functions much like a xerographic copier to produce a page of near-typeset quality.

A mouse. A mouse is a small box with a roller ball on the bottom and one to three buttons on the top. It is used in conjunction with the personal computer keyboard to select commands, text, and graphics. Apple's Macintosh and IBM's Personal System/2 Model 30 come standard with a mouse. It is an option available for other personal computers.

A complete DTP system also requires several software packages:

Page composition software. Packages like *PageMaker* allow users to design pages, set number and width of columns, determine margin width, select justified, ragged right, or ragged left columns, typeset headlines, edit text, merge text and graphics, crop and resize graphics, draw lines, and perform all the other processes generally performed in typesetting, design, and paste-up operations.

Page Description Language (PDL) software. This is software that you can't see, but which ensures that page-composed files can be read by the printer. Adobe Systems' PostScript, the de facto standard PDL, comes with some printers, such as the Apple LaserWriter. It also may be bundled with a complete system (for example, the IBM Solution Pac Personal Publisher System), or on a card that goes into the computer.

Word processing software. This is where the bulk of the writing and editing is performed. Although most page composition software includes a text editor, it generally does not contain many of the features of a word processing package and is best used only for minor editorial changes. The word processing package must be compatible with the DTP software.

Graphics software (if graphics are used in the documents). This can include packages for charting, drawing, painting, CAD/CAM, image libraries, and other graphics software. Again, make sure the package you choose is compatible with your DTP software.

Optional, but helpful and expensive, pieces of hardware are a scanner or a digitizer. A scanner can save you the trouble of re-keying material typed on a manual typewriter or hard copy from a non-compatible word processing system. It scans the printed text and converts it to a machine-storable form. Scanners start at about $2,000 and cannot read all fonts, so the equipment needs strong cost justification. Production houses will frequently scan outside material for as little as $1 per page. Digitizers are much more sophisticated and can cost from $1,000 to $4,000. A digitizer scans half-tones, diagrams, charts, signatures, line drawings, and other documents, and digitizes them so your computer can store the image on disk.

When trying to cost-justify a DTP system, take into account your yearly bills for typesetting and paste-up, the times you've had to settle for less-than-perfect documents because of printer deadlines, and the high-quality documents you could be producing if you had the facilities in-house.

Although DTP has many advantages, some things are beyond its capabilities. For example, laser printers can be very slow, especially if you add many graphics to a document. In most cases, you will use a laser printer to produce a master copy, then reproduce that document on a copier or send it out to an offset printer, depending on the number of copies required, the quality desired, and the required turnaround time.

For example, *PageMaker* can be output on an Allied Linotronic, producing typeset-quality pages. If you plan to produce many typeset-quality documents, make sure that your DTP software can be read by computer-driven phototypesetting equipment.

Despite these few drawbacks, DTP can greatly improve your business communication procedures. As noted, DTP can offer you greater control of the quality of business documents, typesetting bills, and turnaround time. Above all, DTP allows you to improve your communication efforts with your employees, potential and present customers, and community members because it allows you to have more creative input, enjoy quicker access to your documents, and enhance the overall quality of the documents you use to promote your company's interests. □

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IBM System / 2 model 30 8086 processor, 640K RAM, two 720K floppies, Parallel / serial ports	$1695.	$1220.
IBM System / 2 Model 30 8086 processor, 640K RAM, 1- 720K floppy, 1-20MB hard dr., Parallel, serial ports	$2295.	$1650.
IBM System / 2 Model 50 80286 processor, 1-1.44K floppy, 20MB hard dr. 1meg RAM, Parallel / serial ports	$3595.	$2690.
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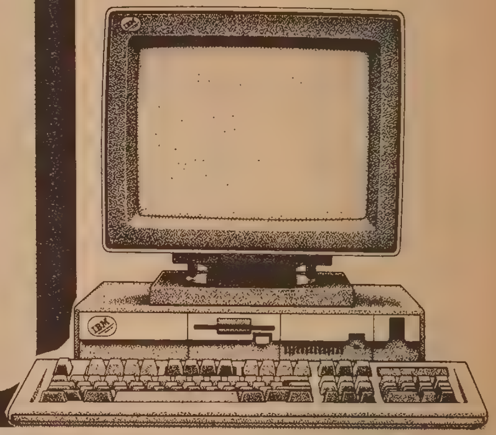

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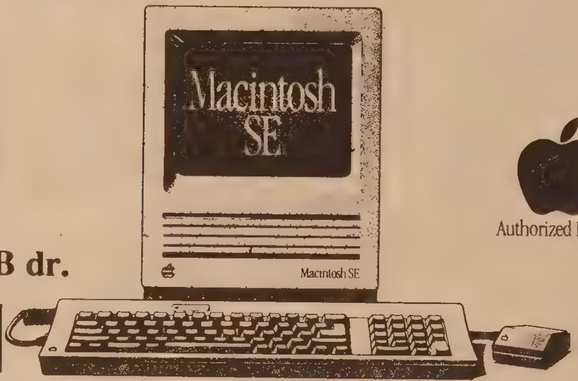

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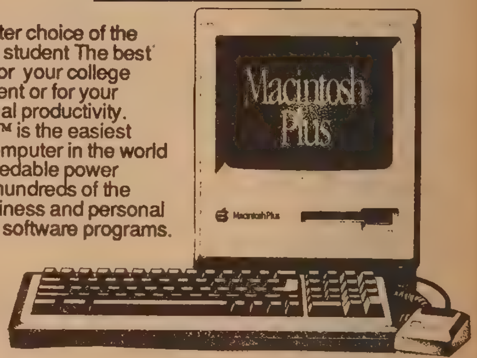

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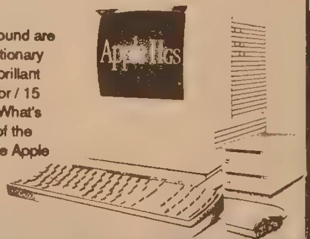

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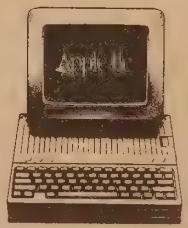

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CALENDAR OF EVENTS

May 30-June 1 Fourth Annual ShowBiz Expo. Los Angeles Convention Center. Call (213) 668-1811 for information.

May 30 Ventura Computer Show. Ventura County Fairgrounds. Call Golden Gate Shows, (415) 388-8893 for information.

June 6 San Bernadino Computer Show. National Orange Show Ground. Call Golden Gate Shows, (415) 388-8893 for information.

June 13 Computer Swap. LA County fairgrounds, Pomona. Call (800) 252-SWAP for information.

June 20 Ventura Computer Show. Ventura County Fairgrounds. Call Golden Gate Shows, (415) 388-8893 for information.

June 24-26 Computer Trade Show. Sponsored by BW&A Productions and MicroTimes. Shrine Auditorium, Los Angeles. Call BW&A Promotions, (818) 905-5476 for information.

June 27 Computer Sellathon and Expo. Shrine Auditorium, Los Angeles. Call BW&A Promotions, (818) 905-5476 for information.

June 29-July 1 Managing Computer Documentation Projects. UCLA Extension. Call (213) 825-1047 for registration information.

July 7-9 Software Quality Assurance. UCLA Extension. Call (213) 825-1047 for registration information.

July 7-10 LISP and LISP Environments: Hands-On AI Workshop. Los Angeles. Call ICS, (800) 421-8166 for details and registration information.

July 11 Computer Sellathon and Expo. Shrine Auditorium, Los Angeles. Call BW&A Promotions, (818) 905-5476 for information.

July 18 Computer Swap. LA County fairgrounds, Pomona. Call (800) 252-SWAP for information.

July 21-24 Hands-On Expert Systems Design & Development. Anaheim. Call ICS (800) 421-8166 for details and registration information.

July 29-31 Computers for Artificial Intelligence Processing. UCLA Extension. Call (213) 825-1047 for registration information.

August 3-5 Software Safety Principles and Techniques. UCLA Extension. Call (213) 825-1047 for registration information.

August 18-21 Data Transportation and Protection. Embassy Suites, El Segundo. Call (213) 825-1047 for registration information.

As a community service, MicroTimes lists trade shows, seminars, and other special events in the Calendar of Events free of charge on a space-available basis. To improve the likelihood of your listing's timely inclusion, please make sure we have the necessary information no later than the first of the month, two months before the cover date of the issue in which you'd like it to appear (i.e. the deadline for the March issue, distributed during February, is January 1). Send to: MicroTimes Calendar of Events, 5951 Canning St., Oakland, CA 94609.

News about user group meetings and other regularly scheduled activities should be sent to User Group Network at the same address.

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LATE-BREAKING NEWS

By Patricia Lesser

Apple News

Apple Computer (408/996-1010) has announced plans to create an independent software company. This company will develop, publish and market applications software for the entire Apple computer product line, including programs developed by third parties as well as existing applications such as *MacWrite* which are now sold under the Apple label. Initial plans call for this new company to be formed as a wholly-owned subsidiary of Apple, and to become an independent company with the next year with Apple keeping a minority ownership position. William Campbell, Apple's former executive VP of US sales, has been named as the president and CEO of the new company and he will be recruiting staff immediately.

Ahead of schedule, Apple has shipped the first Macintosh II. A total of 75 Mac IIs came off the Fremont, CA, production line. The Mac II is intended for advanced applications in business, desktop publishing, higher education and engineering environments. The unit features a 32-bit 68020 CPU, six internal NuBus slots, an optional color display, network connections, and MS-DOS compatibility. Apple will also soon be offering its own version of the UNIX operating system to run on the Mac II.

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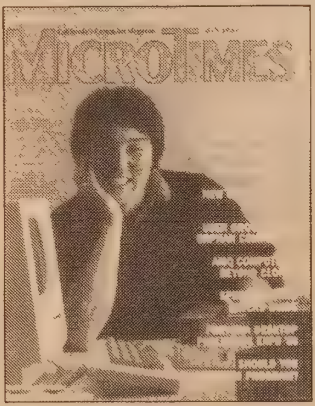
Mac At Work

A Special Quarterly Insert in MicroTimes



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June 10, '87

ON STREET
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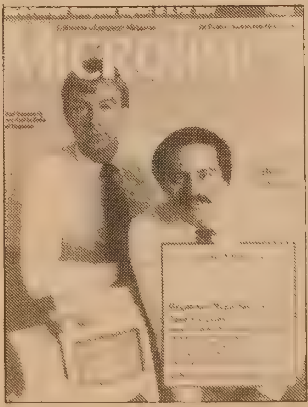

REACH THE BIGGEST MAC MARKET IN THE COUNTRY: CALIFORNIA THROUGH "MAC AT WORK"
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Autodesk Stock Offering

Autodesk, Inc. (415/331-0356) has made plans to register a public offering of nearly three million shares of common stock. The offering will only be made by means of a Prospectus.

Print Shop Recall, Toy Shop Price Cut

Brøderbund Software (415/479-1700) urges all Macintosh users who are operating *The Print Shop* version 1.0 and 1.1 to return their disks to the company for a free update that corrects a bug in those versions. Under certain conditions, a hard disk can be erased when either of the two versions are used. There is a program on CompuServe in the MAUG forum that also corrects the problem.

Brøderbund has also announced that *The Toy Shop* has been re-priced. The IBM and Mac versions will now retail for $49.95 (instead of $64.95), and the Commodore and Apple II version is $39.95 (down from $59.95).

Changes At Cullinet

The corporate reins of control at Cullinet Software are being passed by Founder and Chairman of the Board John Cullinane to David Chapman, effective September 22 of this year. Mr. Cullinane will continue to serve the company as a consultant and will review company strategies.

Intellicreations Joins EA

Another affiliated label has been signed by Electronic Arts (415/571-7171) as part of its Affiliated Labels program. The latest to join the San Mateo, CA, publisher of home entertainment software is Intellicreations (Chatsworth, CA), which will be producing 66 stock keeping units for all major home computer systems by the end of June '87.

Laser Friendly Goes Public

Going public after a merger is a decision that has been made by Laser Friendly Inc. (408/730-1921). First, the company merged with Pirrana Corp. (Toronto, Canada) and now stands as a publicly held Canadian company operating out of Silicon Valley. Principal shareholder is Print Three (Scarborough, Ontario).

Correction From The TaskForce

Our company would like to thank MicroTimes and Mr. Bennett Falk for mentioning our products in his UNIX column in your May 1987 issue.

We would like to bring one error to your attention. Our correct address is:

TaskForce Software Corporation
100 Hegenberger Road, Suite 200
Oakland, CA 94621
(415) 569-9989

Thank you.

Paul V. Farr
TaskForce Software Corporation
(RAM)
Oakland

TaskForce is the publisher of TaskForce V, *a set of system management tools for UNIX users and administrators. We regret that the combination of a very old manual and a misplaced character led to a very inaccurate address when the company was mentioned... — eds.*

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PORT 3
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PORT 5
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EGA card	160
Game Card-2 ports	22
20 MB Hard Disk w/controller	345
30 MB Hard Disk w/controller	375
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Samsung RGB Color Monitor w/swivel	265

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Micrografx Supports PS/2

All of Micrografx Window applications software is now compatible with the new PS/2 family from IBM. The upgraded products include *Windows Draw, Windows Graph, In*A*Vision* and *Windows Clip Art*. The products now support IBM MCGA and VGA graphics standards and the new IBM mouse, with drivers contained for the full 640 by 480 resolution. The upgrade cost is $49.

More Fonts For Softcraft

The crafting of fonts for use with desktop publishing programs is an extremely important element for all users. Softcraft, Inc. (608/257-3300), the makers of *Fancy Font, Fancy Word* and *Laser Fonts* type-enhancement programs for dot matrix and laser printers, has now signed a licensing agreement with Bitstream, Inc. (Cambridge, MA). This will allow Softcraft to incorporate Bitstream's Fontware program into its product line, a definite enhancement.

Vega Deluxe Upgrade

Video Seven (415/656-7800) is announcing a free software upgrade for its Vega Deluxe video adapter. This freebie will make the adapter totally compatible with the IBM VGA, which is Big Blue's new PS/2 graphics standard. The VGA offers a screen resolution of 640 by 480 with 16 simultaneous color display—which happens to be identical to the resolution currently possible with the Vega Deluxe.

Wyse Cuts Prices

Prices have also been cut by local computer manufacturer Wyse Technology (408/433-1000). The company has lowered prices on the Wyse PC+ and original Wyse PC 286 IBM compatibles, while at the same time debuting a new family of 80286- and 80386-based machines. The price of the 9.54 MHz Wyse PC+ is now $1,199, and the 10 MHz Wyse PC 286 is $1,999.

Zenith Increases Shares, Drops Prices

An increase from 50 million to 100 million authorized shares has been announced by Zenith Electronics Corp. (312/391-8181) at the company's annual stockholder's meeting. The 50 million newly authorized shares will be available for business expansion programs, stock "splits" and other future corporate purposes.

Zenith Data Systems (312/699-4839) has reduced retail prices by $300 on its Z-159 line of IBM compatible computers and, at the same time, have increased the computer's RAM from 256K to 512K. The Model 1 with a 5¼″ floppy drive and a HGC/CGA board is now $1,499, the Model 2 with two 5¼″ drives and HGC/CGA board is $1,599, the Model 3 is $2,199 and includes one floppy, a 20 MB drive and MS *Windows*, the Model 12 is $1,899 and has an EGA board and two 5¼″ drives; and the Model 13, which contains an EGA, 20 MB drive, one floppy drive and MS *Windows*, is now $2,499.

Product Announcements

AMIGA

Artwork Add-Ons

Two new artwork collections, entitled *Art Parts: Volume 2* and *Seasons & Holidays* have been released by Electronic Arts for *DeluxePaint II, DeluxePrint* and *DeluxeVideo* for the Commodore Amiga computer. *Volume 2* has over 125 images and brushes that cover a wide assortment of subjects, from stars and planets to human faces and street scenes. The Seasons & Holidays disk provides over 100 ready-to-use clip art images for dozens of holidays and special occasions, such as Christmas and Hanukkah. ($29.95 each).

Deluxe Video

An expanded version of the award winning video animation program *Deluxe Video* has been released by Electronic Arts (415/571-7171) for the Commodore Amiga. The new release is Version 1.2, and has as new features such as Overscan for an edge to edge television look, Interlace for broadcast quality recording and a faster frame rate for smoother animation and scrolling. The program contains a free Post-Production Kit ($29.95 value) which contains 17 scene generators, 18 new images, seven instrument sounds, three sound effects, four wipes, eight pictures, and eight songs for use in video production. Among the effects are custom title screens, and several movie marquees that home video producers can add to their creations. Users who have the Amiga's expanded RAM have access to a larger library of sounds and images while creating their videos. The program uses Amiga *Kickstart 1.2* and can be used with Commodore's *Genlock 1300*, which enable users to overlay images created with *DeluxeVideo 1.2* onto pre-recorded videotape. ($129.95).

APPLE II

IIGS Deluxe Paint

Electronic Arts (415/571-7171) has released Dan Silva's *Deluxe Paint II* for the Apple IIGS computer

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Buy a Lisa
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Macintosh Compatibility

More than 95% of available Macintosh software runs on the Lisa. Call today for our free Lisa Fact Book and see how the Lisa can handle the application you have in mind for much less than you would spend on a newer Mac and hard drive. Plus, we'll let you know how you can have, for no extra charge, up to $425 worth of todays best-selling Mac software titles. Programs like Ragtime, Word 3.0, PageMaker, Excell, Super Paint, Omnis 3 Plus, Sidekick and more.

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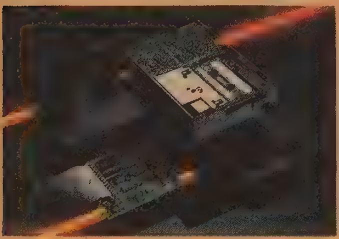
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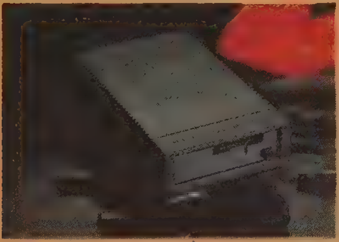
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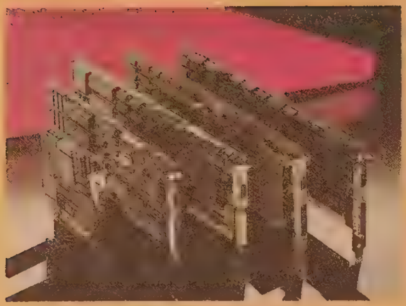

GRAPHICS

EPGA - Professional Graphics Adapter
- Compatible with the IBM* PGC
- Fits into a single slot
- Displays 640x480 graphics in 256 colors
- Emulates CGA, Hercules* and MGA modes

Micro Enhancer
- Compatible with the IBM EGA
- Supports 640x350 graphics in 16/64 colors
- Half card fits in a short slot
- Emulates Hercules and CGA modes

Everex Edge
- Displays 320x200 graphics in 16 colors
- Runs HGA 720x348 monochrome graphics
- Runs Lotus 1-2-3* and Symphony* in 132 columns
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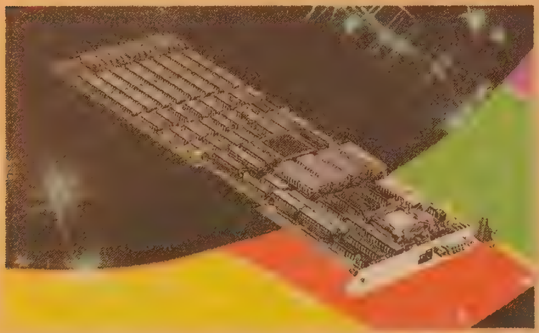

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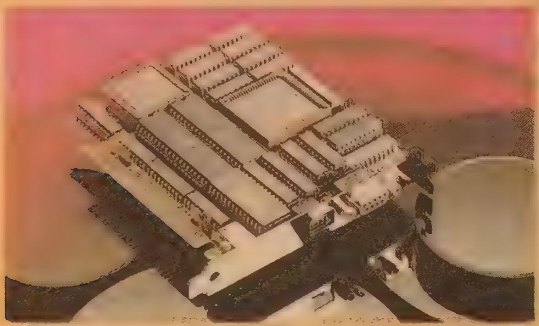

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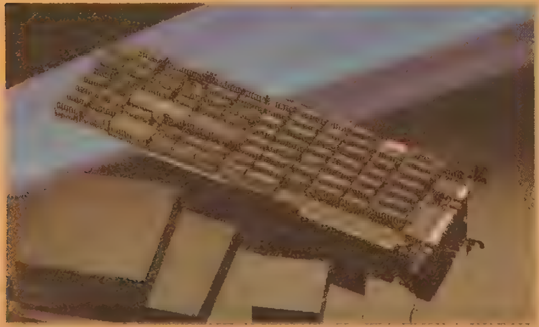

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Excel Stream-60

Excel Stream 60-8
- 60MB cartridge Backup
- 20MB cassette Backup
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- File Restore from Image backup
- Backup across networks
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- Image and File records on the same tape
- Context sensitive help
- Nestable and movable windows
- Extensive diagnostics
- Easy installation program

Excel Stream-20

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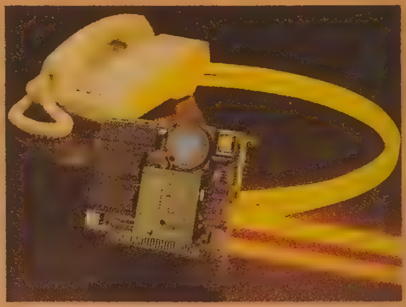
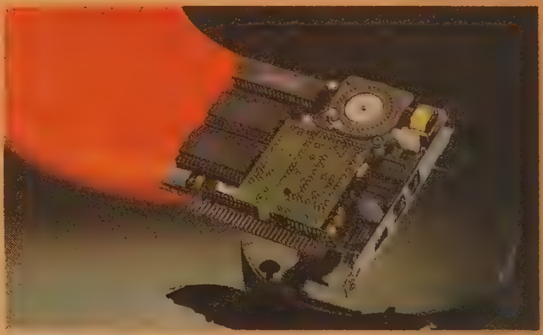


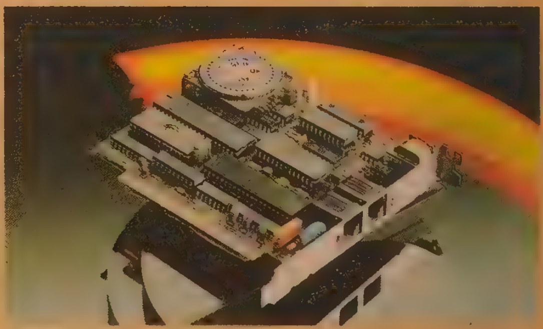
COMMUNICATIONS

Evercom 24 Modem
- International operations at 2400 bps
- Compatible with Hayes* AT command
- Bell 212A/103 and CCITT V.22/V.22bis compatible
- Adaptive equalization
- Automatic answer and voice/data switching
- Phone off-hook detect
- Runs in slot 8 of IBM XT*
- Runs with multi-line phones

Evercom 12 Modem
- 300/1200 bps speed on a short card
- Hayes and Bell 212A compatible
- Supports tone and pulse dialing
- Automatic answer and voice/data switching
- Bitcom software included



Evercom 24



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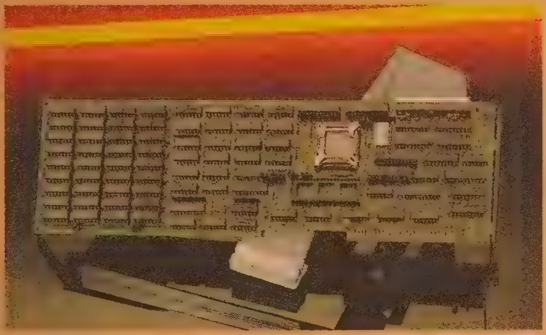
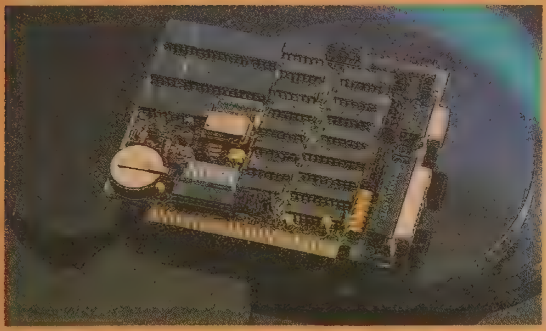
- Parallel ports LPT1-LPT3
- Software included

Magic Card 16

- Up to 2MB of extended memory for AT
- Flexible memory addressing
- Configurable parallel and serial ports



Excelerator



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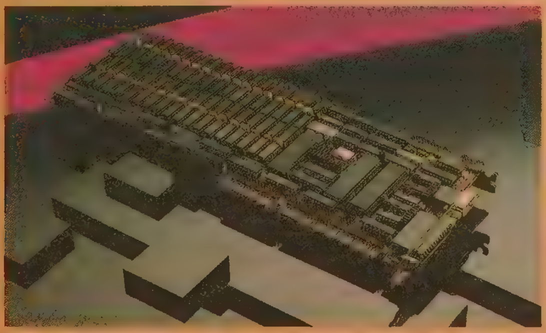

Magic Card 16

HARD DISK DRIVES

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- Half-height, 20MB formatted capacity
- ST-506/ST-412 interface
- 65 msec average access time
- Dedicated head shipping zone

Everdrive 40MB Internal

- Half-height, 40MB formatted capacity
- 40 msec average access time
- ST 412 interface
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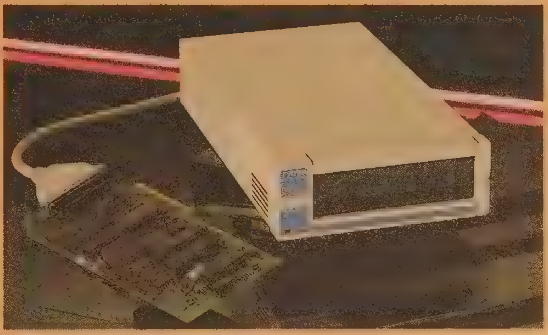
Everdrive 72/80MB External

- 72/80MB formatted capacity
- 30 msec average access time
- 20,000-hour MTBF
- 25-5 Watts power consumption



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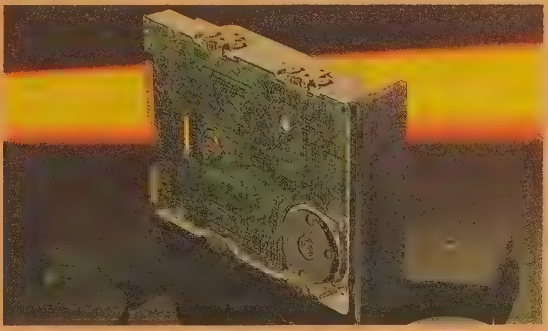

Everdrive 40MB Internal

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OEM PRODUCTS

EV-826 Tape Formatter

- Onboard 8K RAM for data buffer
- Standard QIC-36 drive interface
- QIC-02 interface for host adapter

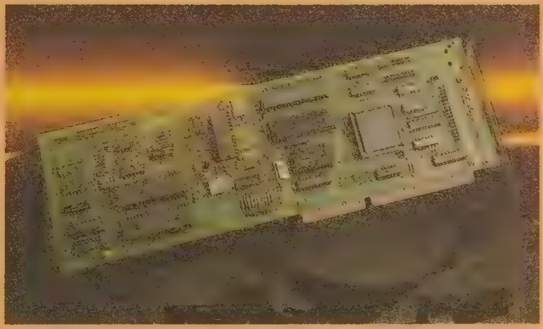
EV-332 Hard Disk/Floppy Controller

- Reduced height
- ST506/412 interface supports 2 hard drives
- 2:1 interleave factor
- 32 bit ECC
- Supports 2 floppy drives

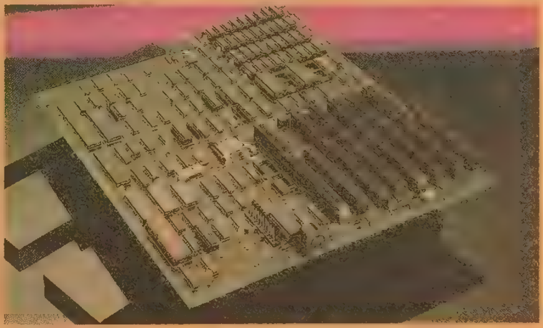
EV-1800 AT Mother Board

- 10MHz zero wait state 80286 CPU
- 512K RAM, expandable to 1MB
- Six 16-bit and two 8-bit slots
- I/O ports and clock calendar

EV-826



EV-332



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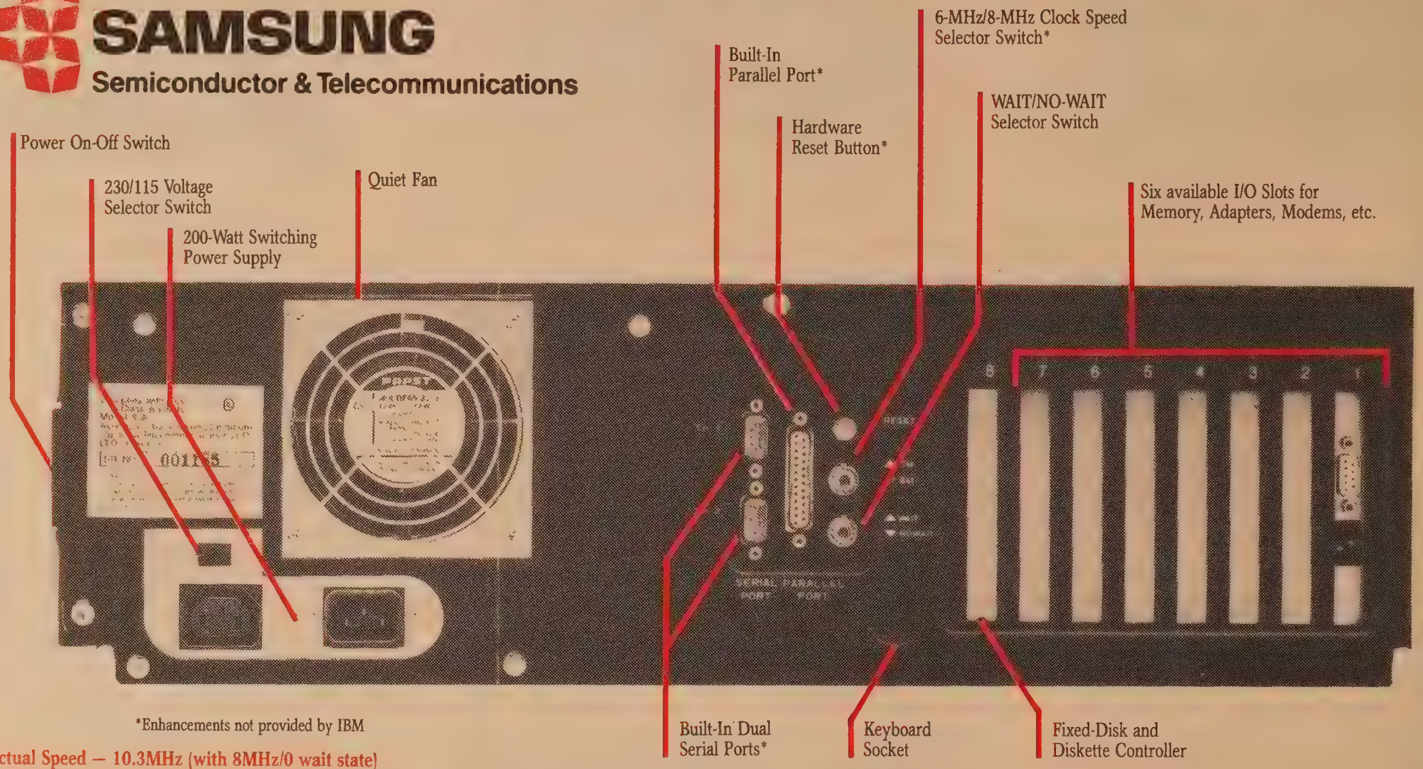

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- Combined Floppy/Hard Disk Controller Card.
- 200-W Switching Power Supply.
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- Push button for hardware reset.
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- FCC/UL approved
- Hardware Reference Manual With Diagnostic Diskette.

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• AWARDS LASER PRESS (Desktop Publishing)	$495
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IBM, XT, AT are registered trademarks of International Business Machine Corporation system. This is an expanded version of the award winning *Deluxe Paint*, and is a professional-quality graphics tool which creates colorful artwork faster and more easily than conventional techniques. There are over 90 painting tools and effects, including Perspective, Variable Zoom, Stenciling, Fixed Backgrounds, Gradient Fills, Pattern Fills, custom brushes, color cycling, font control and symmetry. Virtually any image can be brushed, and artists have a custom palette of 16 colors from 4,096 available shades. Four-level Zoom and anti-aliasing are also supported. ($99.95).

ATARI

Graphics Companion

Datasoft (818/886-5922) has a new addition to its computer/VCR utility product entitled *Video Title Shop*. The company has now released *Graphics Companion*, which offers pre-designed screens covering all of the major holidays as well as screens for special occasions. The main program allows the user to create graphics and text screens that can then be copied to video tape and used as introductions to, or comments on, their videos. Features included in the main program include wipes, multi-directional scrolling, fizzles, controlled time sequences, and a selection of size and type styles. The *Graphics Companion* screens are designed so that you can insert your own text or modify the graphics for a more personalized version. The disk contains 25 screens and five borders. ($19.95).

IBM & COMPATIBLES

Multi/Cam

Combining the ease of use of the PC with the power and storage of the mainframe comes *Multi/Cam* from AGS Management Systems (215/265-1550). *Multi/Cam* is a micro/mainframe based CASE (Computer Aided Systems Engineering) program that is used for systems analysis and design, program development, project management, documentation, communications and training from a single automated workstation. Systems development includes multiple development life cycles supported by a standard framework, with project prioritization, estimating, scheduling and tracking all standardized and linked together.

Equation Solving Problem Solved By Borland

Anyone who requires equation-handling power that is not currently available in calculator packages may wish to take a peek at *Eureka: The Solver* from Borland International (408/438-8400). This is a second generation package that provides fast and reliable solutions to real-world mathematical problems. The program will solve complex problems that contain undefined variables, generate tables and plots, and perform "what if" analysis. You simply write an equation, set the options, and instruct the software to solve the problem at hand. After the equation has been solved, *Eureka* can then verify and display the accuracy of the solution. Powerful, expanded record-keeping and reporting features are included. ($99.95).

Enhanced PC Tools

For only $39.95, Central Point Software (503/244-5782) has released a brand new version of *PC Tools*. Version 3 includes Mirror and Rebuild, programs that restore lost information due to accidental use of the DOS FORMAT, RECOVER and ERASE commands; Compress, which optimizes your hard disk; and PC Backup and PC Re-

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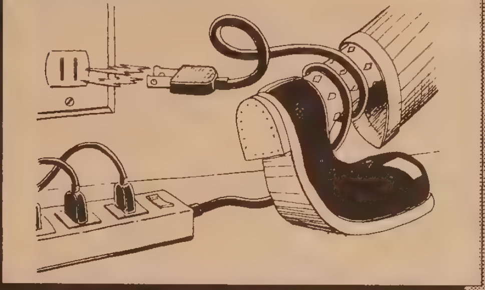

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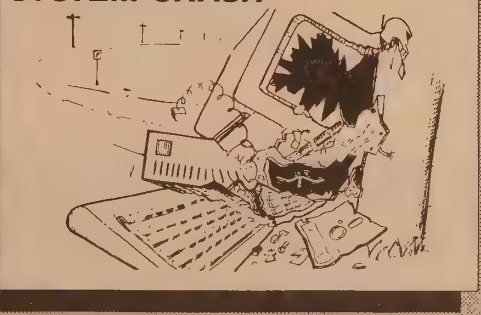

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When the keyboard freezes up you've got to reboot—and you can't even save first. But with BOOKMARK, work is already saved.

BOOKMARK™

Memory-resident utility software that automatically saves work in progress to the hard disk at user-definable intervals.

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Requirements:
IBM PC/XT/AT or 100% Compatible • 256k to 640k • IBM DOS 2.1 or Higher, 1 Floppy Drive • Hard Disk Drive (10 Megabytes Minimum) • Video Display Adapter IBM (Monochrome, Color, Enhanced Color) Hercules, AST (BOOKMARK occupies an equivalent space on hard disk as in system RAM plus video RAM).

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store, programs that quickly backup information from a hard disk to floppies. *PC Tools* also supports IBM's PS/2 computer family and possesses an optionally resident DOS shell.

Channelmark Organizers

Three new programs allow users to organize address lists, easily produce columnar financial reports, and read a new product catalog containing several productivity utility programs. From Channelmark Corp. (415/345-5900) comes *Pocket Address Book*, which creates a handsome, pocket-sized book of all selected entries, as well as rotary cards, labels, and envelopes. This new program accepts data from other programs, as well. ($59.95). The second program is *Financial Reporter*, which automatically aligns columns, calculates math and adheres to the user's preset format for presenting figures. The program can accommodate as many as eight numerical columns and calculates up to five levels of subtotals in addition to the total. Data can be entered a column or a row at a time with as many as 200 lines in a single report. ($49.95).

Statistically Superior

Version 1.5 of *Stata*, statistical software from Computing Resource Center (213/470-4341) Includes maximum-likelihood logit and probit estimation along with Anova and Ancova estimation. It also supports both standards of EMS. The maximum-likelihood logit and probit estimation may be performed on individual or grouped data that can be weighted or unweighted as well as with continuous or categorical independent variables. Datasets can now be up to 8 MB and contain as many as 32,754 observations! *Stata*'s graphical features include many types of analysis graphics, such as scatterplot matrices and one way scatterplots, in additon to the typical representation graphics, such as bar and pie charts. ($590).

DAC Accounting Package

Dac-Easy Accounting 2.0 is the first of a new line of business software products from Dac Software (214/458-0038). The new versions have been completely re-designed in a new language for complete connectivity and performance and are priced at $69.95. The new programs include: *Dac-Easy Payroll 2.0, Dac-Easy Mate 2.0, Dac-Easy Report 2.0*, plus two *Tutor 2.0* packages for the Accounting and Payroll packages.

Data Defender

As the foolproof computer has yet to be invented, the next best thing is a utility package that can rescue virtually any form of lost data, including accidentally erased files, reformatted hard disks, and even RAM memory lost during power disruptions. Impossible, you say? Not according to Design Software Inc.(312/231-4540). The company claims that *DS Recover* can do just that, save your data. The program is easy to use and ensures that any erased file can be recovered at any time, even if other files have been subsequently written to disk. The program reserves disk space occupied by an "erased" file until the user intentionally purges that file at a later date. A "snapshot" option periodically saves RAM memory to a file on the hard disk. Users can set the RAM-to-disk transfer to occur automatically after a set number of minutes or keystrokes, or this feature can be requested explicitly at any time. ($49.95).

Also from Design are three other programs. The first is *DS Optimize*, a program that will optimize a badly fragmented 10 MB hard disk in eight minutes. This program can increase disk access speed ten fold. The second and third offerings are *DS Utilities* and *Survival Kit*, two-in-one bundled versions of the company's hard disk utility pack-

Read All About It!
What The Experts Say About Atari

"The most advanced, most powerful microcomputer your money can buy"
Creative Computing

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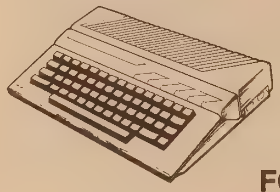

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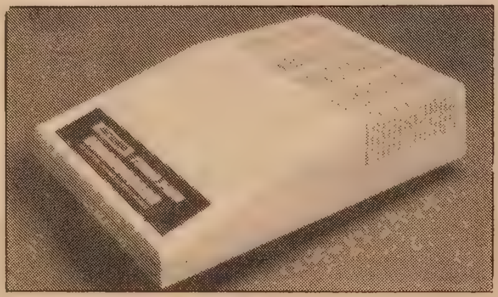

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ages. They are priced at $99.95 each. *DS Utilities* combines *DS Recover* and *DS Optimize*, while *Survival Kit* combines *DS Recover* with *DS Backup+*.

Disk Managers Are Now Unprotected

New, non-copy protected versions of *Diskette Manager Plus*, version 1.1, and *Diskette Manager II*, version 2.1, have been released by Lassen Software, Inc. (916/891-6957). The first program automatically reads the directory from each diskette and prepares a catalog with that information and the user-provided comments. Each catalog diskette may store information for as many as 200 diskettes. As the disks are read, labels can also be printed for them. The second program supports all of these mentioned features and also creates a relational database from the information stored on your catalog. You can find a specific file using DOS "wild card" searches and can cross-reference your diskettes in any manner you wish. ($10 and $20 respectively).

ZIP Coding Becomes Zippier

There are 38,000 ZIP codes used by the United States Post Office. Try to find the town of Smith without knowing the state it's in, and you could be searching your handy ZIP code booklet for hours. From Mellisa Data Company now comes *ZIP Code Facts*, a software-based database that contains the ZIP code, its corresponding city, state, county, type, latitude and longitude. This is a collection of facts on all of the ZIP Codes in the 50 states, District of Columbia and Puerto Rico and is intended to be used with a database program such as dBASEIII, Reflex or Rbase 5000. Information is included on 2700 post office boxes and 550 APO/FPO's as well. The database occupies over 5 MB of storage, so a hard disk drive is recommended. ($129). (714/770- 5570)

Compilers For XENIX

Microsoft has released the Microsoft BASIC Compiler for personal computers running the XENIX System V/286 operating system. With this offering, you can run programs written in the MS-DOS version of Microsoft BASIC and GW BASIC Compiler, as well as those written in Microsoft BASIC Interpreter for the XENIX environment, with little or no modification. Software developers will now find it far easier to port their MS-DOS applications to the XENIX multi-user environment, and compiled programs will run three to ten times faster than those created with the MS BASIC Interpreter. ISAM support is included.

Microsoft has also released updates of four other languages for the XENIX 286 environment: Microsoft BASIC Interpreter Version 5.41, Microsoft FORTRAN Compiler Verison 3.31, Microsoft Pascal Compiler Version 3.31 and Microsoft COBOL Compiler Version 2.2.

Upgraded Graphics

An upgraded *OfficeGraphics 2.0* from Office Solutions (608/274-5047) allows users to capture images created by such programs as *Chart-Master, Graphwriter, Lotus 1-2-3*, and others, and then insert those graphics directly into the company's word processing program, *OfficeWriter 5.0*. *OfficeGraphics* has been upgraded allowing it to edit existing images, to preview the image and text as they will appear when printed, and to move easily between programs while editing. With this new version, images can also be enlarged, reduced, rotated, boxed, circled, edited and positioned in text. If purchased prior to July 31, 1987, the price is $69. After that date, *OfficeGraphics* is $145.

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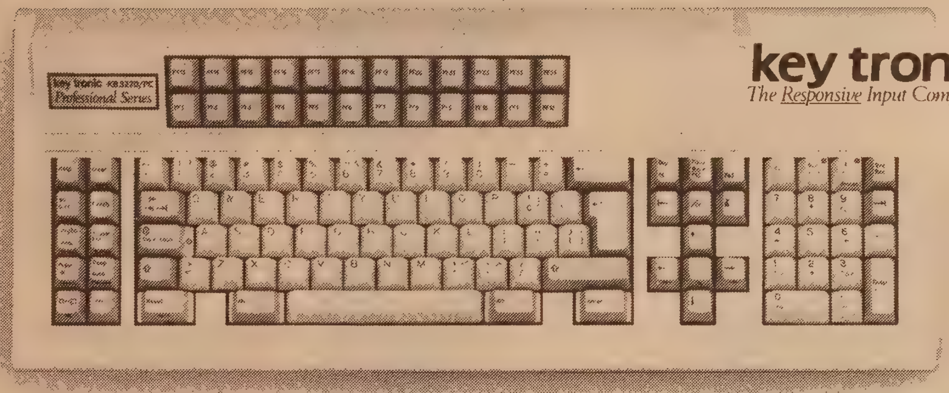

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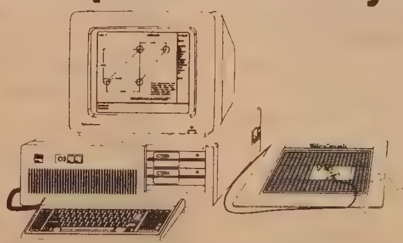

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The Industry (And The Press) According To DVORAK

By Mary Eisenhart

Informative, irreverent and irrepressible, John Dvorak comes perilously close to being a household word, at least in computer-owning households. His columns—all different—run in computer-oriented (e.g. *PC Magazine*, *MacUser*, *DEC Professional*) and other publications (for instance, he writes separate computer and general-interest columns for the San Francisco *Examiner*). Each features a melange of news, product reviews, gossip, and unique analysis that ranges from insightful to flip.

"I'm kind of a populist," he says. "My responsibility is to my readers." Woe betide the purveyor of a deficient product that falls into Dvorak's hands and becomes the target of scathing rebuke—though Dvorak himself says he's likely to reserve the heavy artillery for the products of large companies, on the grounds that a bad product put out by an obscure start-up is likely to fade away without any help from him, whereas a heavily-promoted turkey is likely to sell thousands of copies to hapless users before the word gets out. "People deserve to be protected from that," says he. On the other hand, he delights in informing his readers about unknown but excellent products.

Dvorak's involvement with computers dates from around 1975. He was working for the Air Pollution Control District when his department acquired an HP 3000 minicomputer. "My department wasn't using it for anything, as far as I could tell," he recalls, and nature abhors a vacuum, so he went back to the University of California to take programming courses (although he'd taken some computer classes during his college days in the '60s, he'd graduated with a degree in history and enough background in chemical engineering to keep him working chiefly as a chemist).

When the first personal computers became available around 1976, an intrigued Dvorak bought a Sol computer with a Northstar disk. One thing having led to another, he was soon publishing a newsletter called *Software Review*, which, he says, "was one of the first in the country that was trying to market public domain software to the Northstar audience."

After a few years in which both newsletter and software business prospered, Dvorak was offered the editor's job at *Infoworld*. During his year and a half at the helm, he says, the magazine's circulation grew from about 20,000 to about 85,000. "I developed a front page formula that was rather successful," he recalls. "We had a real talented staff, and I let them do their own thing. I also brought in as many columnists as I could get—in fact we had just about every columnist that *was* a columnist, with the exception of Jerry Pournelle. We had a lot of news, and we had an excellent review system. It was pretty good."

Through the ensuing years, through unrest, coups and shifts of editorial policy, Dvorak's Inside Track column continued to run in *Infoworld* until mid-1986. "I don't change without some impetus," he says. "I kind of hung on for awhile until *Infoworld*'s direction changed radically and they

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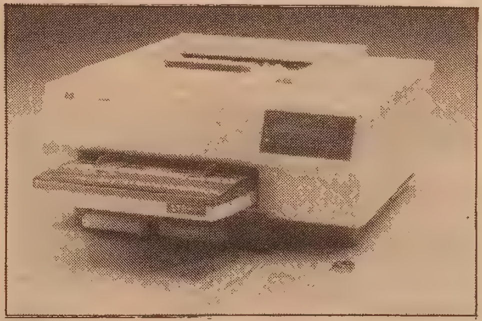

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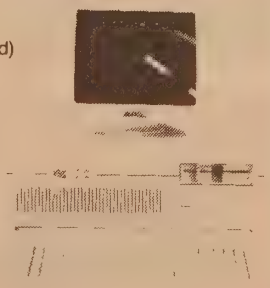

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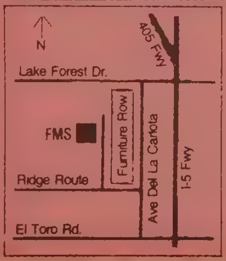

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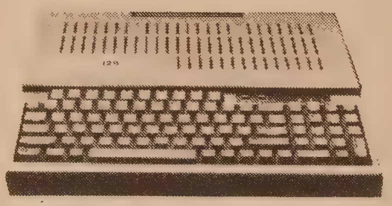

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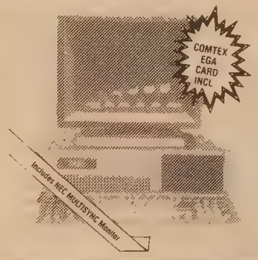

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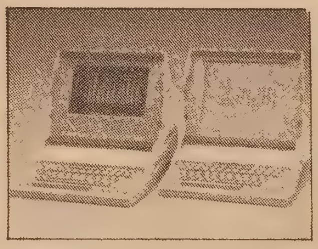

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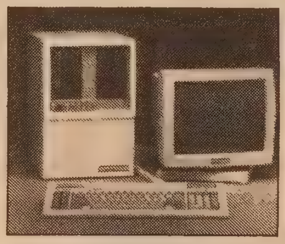

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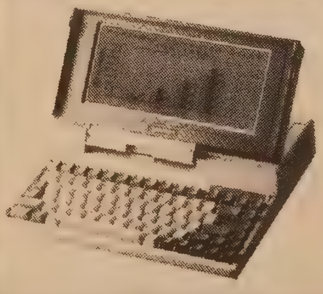

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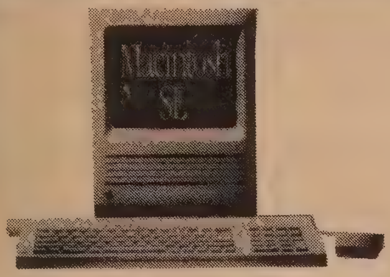

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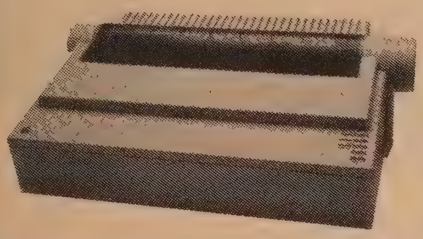

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weren't interested in the column, despite what their readers wanted."

These days he's writing for *PC Magazine*, published by Ziff-Davis. 'The crew at *PC Magazine*, and the magazine itself, is probably the best thing in the country," maintains Dvorak. "Everybody on the staff is a computer enthusiast, and the executive editors and the editor-in-chief are very knowledgeable. It's a situation where if you write something and you're pushing your luck on your facts, they'll cover for you so you don't go out there and say something stupid. Considering the size of that magazine, it's amazing how few technical errors are in there. If they say something is black and green, it's black and green. You can count on it, and it's very comforting. Because sometimes you're working with rumors or gossip about something, or you've got your chip number wrong or who knows what, and they'll catch it all the time. It's rare. It's just unbelievable. And it's one of the most fun groups I've ever been with."

If you want to get in this scene inexpensively, your clone is your only alternative. Right now the real hot market is these Taiwanese and even American-made cheap clones, because it's an entry-level point. An XT clone's a heck of a deal. Especially with the turbo boost where you get a faster processor.

What were your ideological differences with Infoworld? There seem to be a lot of complaints from readers that they've gone totally corporate.
They had a theory that sounded good at the time. I think *Infoworld* didn't have to go 100% corporate, because they were doing fine. The corporate people were reading it, and all they managed to do was lose the part of the audience that was more interested in *Infoworld*'s old reputation, which was hard-hitting and kind of zany. There's really nothing remotely zany in *Infoworld* now, except they tried to make [gossip columnist] Cringeley artificially kind of like [**PC Week**'s] Spencer Katt.

Which was kind of me-tooish at that point.
Yeah, it was me-tooish, and it wasn't that zany. So it became kind of—I don't know what the good word is . . .

Stuffy?
Stuffy. It became stuffy, and these things are always a reflection of the editor. It's a stuffy publication. It seems to still have a fairly good corporate following.

The idea initially—which I now think was a mistake, looking back on it, because it assumed too much—was that there are micros going into businesses, and the MIS people need some help in integrating them into their business, and they really don't know what they're doing. So let's talk to them because it's a huge group.

This ignored the fact that MIS people really don't have that much to do, and what they end up doing is, when a trend like this occurs, they go to seminars like there's no tomorrow.

That's what keeps the Seybold [seminar] people rich.
It keeps the Seybold people rich, it keeps a million guys rich—and MIS people get up to speed on this faster than anything. They become kind of microcomputer hackers and nuts and enthusiasts. They know a lot, and you can't make money by talking down to them, which is essentially what this theory dictates.

That's why, if you want to see a magazine that's flying, look at *PC Magazine*, which during the same period has grown from 300,000—it's at 450,000 now and should be at 500,000 by the end of next year. It's grown more then the entire circulation of *Infoworld*. And it's grown like that without any subscription solicitation. It's just people volunteering—and that's because what we try to do is appeal to hackers of all sorts, and it's mostly the businessman, or the MIS guy, or whoever it is that's in the company that likes microcomputers.

We just load them down with hard facts, information, and analysis. We don't try to explain to him how the microcomputer fits into his environment—he already knows that. You don't need to keep beating a dead horse about how to talk your boss into buying a micro and all that kind of stuff. You just tell them—here's the new EGA card that came out. Here's 500 of them—here's the one that's good.

It's a pretty interesting magazine. It's a phenomenon, which is one of the other reasons I kind of like being there, because it's a phenomenon that I don't think will be repeated in publishing history too often.

What kind of audience do you personally address in your columns?
I try to talk to the guy who wants just one little extra edge over what the rest of the magazine can provide, and that edge is the ability to see through fads or the ability to find some obscure product so he can show off. My column basically consists of some gossip that you can't get anyplace else, some analysis that's a little different from what everybody else is saying, so if you want to get into an argument you can use my ideas, and also some information about products that are obscure but good. So you can say, look what I've got, and everyone thinks you're wonderful.

It provides people with just a little edge, and it also has entertainment value. Most of my stuff in *MacUser*, for example, is purely entertainment.

I try to be entertaining as much as possible, because I feel that if you have any points to make they're more easily made if they're couched within an entertainment formula, because people can read it easier.

One of the complaints I would get occasionally, depending on what editor would come through *Infoworld* during the time where there was a lot of transition—they'd question why this Inside Track column was in *Infoworld*, because we're not appealing to "industry types," and my column tended to sound like it was for "industry types."

We're talking to the business user, or the end user, they would say, and I'd have to always give them the counterargument and say, look, you're missing the point. If you look in the back of *TV Guide*, there's always this thing that looks like a bulletin, it's written on yellow paper and it looks like it's written by a typewriter, and it's about who's going to be in what movie, how much a movie's going to cost, what we can expect to see next season, and all this stuff which appears to be industry news.

Why are they putting this in *TV Guide? TV Guide* is not an industry newspaper. Well, the reason that people do that, and they do it in all fields, is because the readers like to feel that they're part of something that's bigger than they are, and so you give them this kind of industry-like thing just for their benefit. Readers eat it up.

Other things that readers like, and *Infoworld* took them out—we always used to have the best selection of cartoons, and now, except for *Dr. Dobb's Journal*, which runs maybe one or two cartoons, there's not one magazine out there that runs cartoons, except maybe *Ahoy!* or one of the other machine-specific things for home audiences. People *like* cartoons—it's for the reader's benefit that you do some of these things.

One of the problems with all the computer magazines is that they get a little uptight about what they can offer the reader. They don't think like mass-market magazine people think, which is that readers like variety, and cartoons, and kind of insider-type columns, gossip column kind of things. There's no question about it.

Today's gossip is tomorrow's product, too.
Yeah, to some extent, but I would say that a lot of stuff that is being worked on and illegitimately being worked on never sees the light of day, it's just kind of interesting to know that somebody's working on it.

What kind of feedback do you get from your readers?
I get pretty good feedback. I get different feedback from different magazines, and most of the people don't know I write for other magazines. There's not too much cross-fertilization, which I think is kind of interesting. *MacUser* readers don't even know I write for *PC Magazine*, and *PC Magazine* readers are always surprised when they find out I write for *MacUser*. That's always kind of shocking, but that way when the

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mail comes in it's very distinctive.

The Macintosh people are the most interesting, to be honest about it. The mail always is fancy. It's either on a LaserWriter or on a printer using different fonts, or the guy's made a very elaborate letterhead—it's unbelievable compared to the letters I get from IBM people, which is usually just a daisywheel output, stock letterhead—very old-fashioned compared to the stuff you get from Macintosh users. Mac users are either diehards or very cynical in a funny kind of way that's indescribable. The personality of a Macintosh user is not the same as the personality of a PC user.

In what way?
I think they're kind of iconoclastic. They like to be different—they're not quite as bad as someone who builds a kit car, but it's definitely along the lines of the convertible owner or somebody who doesn't like being in the crowd. It's just like those [Apple] ads of those people walking off the cliff—it's pretty accurate.

PC users are more pragmatic, there's no question about it. They are practical, no-nonsense types, and they prefer a little harder, news-factual edge on the material they read. I don't think they'd put up with the column I write in *MacUser*—which is probably the best column, generally speaking, insofar as experimentation is concerned, in any of the magazines. Because it's acceptable in that area. It's a little too wacky, I think, for the PC people.

Do you think Apple is going to be successful at getting the Macintosh entrenched in the Fortune 500?
I think they're going to get an entrenchment, but not on every desktop like they'd wish for. I've been pushing it from day one—it's a wonderful executive's tool, an executive secretary should have it to do correspondence with a LaserWriter—you can produce fabulous memos and incredible-looking personal correspondence with it. It's very expensive, but for the executive, you can really look like the top guy.

Also any graphics applications—IBM has really not been able to come up with anything close—I don't care how much they try, even with the new cards Apple's just got such a lead on them. Producing fancy output on an Apple is just easier. And also the mouse theory and the way the mouse works on the Macintosh is so much easier, just more comfortable. The IBM mouse drivers—I've yet to run into one that's worthwhile.

There's an accelerator algorithm in the Macintosh mouse, and the way you can understand this is—go to a store and find a Mac mouse and an IBM mouse that are working, and put them on a piece of paper. Take a pencil and push the arrow to the top of the screen, mark on the paper where the top of the mouse is, and then move ever so slowly down to the bottom of the screen, and then mark the position of the mouse. Now go back up, put the mouse on that upper mark and get the arrow back where it belongs, and then jerk the mouse down as fast as you can. The arrow will get to the bottom of the screen in about half the distance. If you move it real slow, the resolution increases so you can really pinpoint where that mouse has to go. If you want to just move the mouse across the screen, you can move it real fast.

With the IBM mouse you'll find that no matter what speed you move across the sheet, it'll be the same top and the same bottom. So you're always in high gear, and it's not the way it should be done. It's very uncomfortable and very hard to use, and all IBM applications use the mouse that way. It's just annoying.

I don't understand it. Everybody talks about it—when Apple first developed their mouse interface, they talked about this simple trick—and *still* it doesn't come over to the other side because these two groups don't communicate. I don't know what the problem is.

Do you think the new IBM Personal System/2 computers are going to make a serious dent in the prospective Macintosh-buyer market?
No.

Who's going to buy them?
I think just an upgrade—corporate guys are just going to move to them. The big buyers, the Army kind of people. I don't see that they have much appeal to a guy who's trying to get a cheap system up and running. He can do just as well with a clone—especially when they come out with an EGA card, which has already been announced by two or three manufacturers—the graphics can be the same, you can get 3 1/2" disk drives and you'll be in business. You'd just have a different bus, but I don't think that's going to be a problem for at least two or three years. By then the bus'll be cloned, if we're going to move to that bus. We've got plenty of time to do it.

Meanwhile, clones are now $500 and ordinary folks are buying them because it's their most reasonable option. Is that going to change what's being written for those machines?
I don't see it. The other operating system's not out, so that part of it's academic.

The fact of the matter is if you want to get in this scene inexpensively, your clone is your only alternative. The Apple II is, I think, a dying machine—Apple should bring out some kind of a low-end Macintosh and maybe a super-cheap $250 Apple II clone, and they would get some of this business. But right now—and I don't know why Apple has ignored this market, because they can compete in it as well as anybody—right now the real hot market is these Taiwanese and even American-made cheap clones, because it's an entry-level point, like Radio Shack use to do it, and you can upgrade, and you've got a big bus there. Radio Shack isn't really doing it right, because their upgrade path really isn't as much of an upgrade path as you get when you buy an XT clone.

> ***I think that it's getting a little old that we can't come up with anything that's radically new, such as the spreadsheet, which has revolutionized sales. I wish that something would happen pretty soon, because I don't want to see this scene degenerate into spreadsheets/word processing.***

An XT clone's a heck of a deal. Especially with the turbo boost where you get a faster processor. They outperform a lot of stuff that's out there.

All of a sudden a lot more games are being written for IBM.
That's because the home market has discovered that they can buy an IBM computer, more or less, although it doesn't have an IBM logo, for far less than $1000, and these people want to play games too. All the game manufacturers are just shocked by this—it started about two Christmases ago. I went to Whole Earth and talked to them about their sales of games and they told me that IBM had tied Apple. And now it's maybe even more.

The irony, of course, is that unless you have an EGA card, which is about $200 added onto your clone, the games that are running under CGA are the original old graphics, just terrible compared to an Apple. IBM games are very ugly.

Do you think it was smart for Atari to suddenly bring out a clone line?
I think that's a red herring. They just wanted to show off and scare the pants off of Commodore, is my theory. We'll see. Commodore's clone is a disaster. It's the most overpriced thing on the market, considering—you might as well buy an IBM.

Commodore, I don't know. I guess they've been around long enough, got enough people out there using those machines that they'll stick around for awhile.

Atari—the STs are quite nice and probably offer the most computing value right now.

If you were an entry-level person, what would you buy?
If I was an entry-level person, I'd see what my friends had, and what I could afford, and if I had a buddy with an ST I'd probably get an ST.

If I was in college—when you're in college you can get a Macintosh so cheap, at something like half price, which is why you see so many college kids with Macintoshes—I'd probably get a Macintosh. If I didn't have this opportunity, or I just wanted some cheap computing power, or learn to program a 68000—there's the ST; you can also buy a cartridge that fits into the Atari and turns it into kind of a Macintosh.

Anything else you'd like to say to the folks?
Hi mom!

Yeah, here's one. I think that it's getting a little old that we can't come up with anything that's radically new, such as the spreadsheet, which has revolutionized sales. Ever since the invention of *VisiCalc* there hasn't been anything shockingly new—with the possible exception of maybe desktop publishing, which I don't think has the impact of the spreadsheet. And I wish that something would happen pretty soon, because I don't want to see this scene degenerate into spreadsheets/word processing, which it seems to be doing.

Also, on the game side, we haven't seen any breakthrough games almost since *Pong*. I complain about this all the time. There's only been the maze games, *Pac-Man* type, the move-and-shoot game, *Galaxian*, and adventure games, where you roam around, and simulations like chess and things like that. Since the maze game, *Pac-Man*, there hasn't been a new game invented that's something compelling. I wish there would be, because that's getting old too.

Any theories where these breakthroughs might come from?
If I did, I wouldn't be writing about them. I'd be in business, and Dvorak's Software would be rolling along here. ☐

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TODD RUNDGREN:

Connecting Artist And Machine

By Charles Bermant and Mary Eisenhart

PHOTOS: JIM MARSHALL

Todd Rundgren's computer obsession began as a teenager, when he would visit the local telephone company's billing office after school to learn how to use the cumbersome punchcard-driven mainframes. "They were indulgent," he recalls of the Bell Tell crew. "Maybe because everyone was a customer of theirs. Also, it was unusual for somebody who was just getting into high school to show some interest in this."

Despite detours into rock semi-stardom, both as a soloist and with Nazz and Utopia, the interest still flourishes. Rundgren was one of the first to elevate overdubbing beyond the curiosity level, well before MIDI. Currently he's become an expert on programs that turn a PC into a paintbrush.

As Rundgren has delved more deeply into the computer universe, there have been fewer records. For over a decade he cranked out more than an album a year. Today, his most recent new record is *A Cappella*, released in September 1986. While that album's sales were less than overwhelming, it provided a metaphor for Rundgren's entire career. There was the buoyant pop tune aimed at the singles charts. There were heartfelt ballads along with a cover of an old soul song. There were flashes of eastern intrigue and a hyperactive drenched-in-dementia rocker.

At the same time it was unlike any album Rundgren—or anyone else—had ever made. Handclaps aside, its every sound originated from his mouth. His voice was overdubbed, modulated and synthesized, pushed to sound like guitar, keyboard, bass and drums.

He's also been performing recently as a soloist, backed only by a wall of electronic equipment. In performance Rundgren uses *Texture*, a program written by Utopia bandmate Roger Powell, driven by an IBM PC compatible, and an Apple Macintosh to control the accompanying video effects. He adds live keyboards, vocal or guitar to the programming, resulting in a full band sound controlled by one person.

This setup replaces a tape cartridge system he used for almost 15 years. While some fans prefer the taped backing tracks, long-time sound man Chris Andersen feels the *Texture*-ized system is both better sounding and easier to control.

It still looks odd, one performer against a wall of sound. It's not a matter of hiding behind the technology—this setup makes him far more vulnerable as a performer, since there's nothing for him to fall back on.

Currently, he is writing the music for a Broadway production of the late Joe Orton's "Up Against It" (once intended as the third Beatles movie). And he is always adding to his production credits, which range from Badfinger to XTC (his latest is Bourgeois Tagg). All along, he reflects the transition into the personal computer age, proving the new machines need not lack soul.

"When I was growing up there were two things that I wanted to be, either a computer programmer or to be in a band," he says. "The real reason I became a musician is because it was something that required a natural talent that I had, and I didn't have to go to school. All I had to do was 'woodshed,' take my guitar and practice it until I got good."

"In the same way," he adds, "the people who are writing the good software today are good not because they went to school—they taught themselves. These are the people who are providing the creative force behind the whole industry."

Historically, Rundgren has been far more interested in artistic expression than wealth and fame. Of his band Utopia, which has been more or less on hold for quite some time, he says, "It's still on sabbatical, sort of suspended animation. It's not death but the next best thing. There doesn't seem to be any need for any of us to do it right now. Instead of making records because we enjoy it, we have always had it in the back of our minds that this was our financial well-being on the line. We will not make another record until we can do it without this pressure." He adds: "In order for anything to be subsidized there is marketing involved. I don't care if people tape my records and pass them around because I made them to be heard. If I don't make money off it, that's unfortunate, but it's not the reason I make music."

He's quite happy with the degree of relative obscurity that allows him to pursue his creative interests: " I don't care to promote myself. I'd like to be financially comfortable. The biggest drag in the world is having to think about money. I have no patent desire to be famous.

"Famous people get flak from all directions. People will not let you alone when you're in a restaurant and want to eat. When you don't want to think about it you don't have a choice. Somebody as famous as Bruce Springsteen or Prince, a certain part of their life is gone forever. They can't just get up and pretend to be normal. People are always going to be reminding them of what it is they do and what they are and what they mean.

"It makes it hard to get a certain equilibrium. I don't want to be constantly reminded of what other people think I am—I have too much trouble trying to figure it out myself."

The immediate problem he perceives in making computer technology available as a tool to musicians and artists lies in the area of user interface—the process by which the human tells the machine what to do. He feels that the interfaces currently available are designed to facilitate control of the software's capabilities rather than providing what the user wants or needs. These

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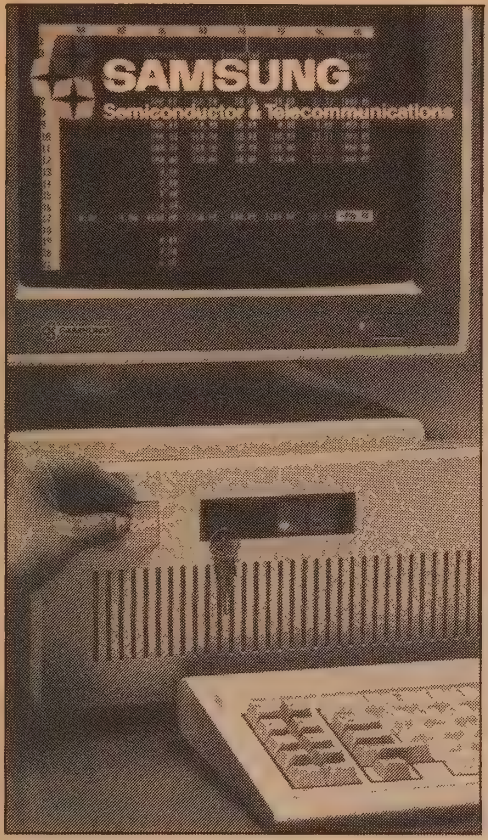
Charles Bermant is an Associate Editor at PC World and has written about music for a variety of publications.



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interfaces rarely conform to the natural attitude that the user has about the software, which greatly diminishes the usefulness of the tools they provide. Rundgren, on the other hand, is working on interfaces designed to keep the machine unobtrusive and let the artist or musician work.

Technology, however, is no substitute for creativity. Just as the world's slickest word processor won't do much good if you don't have anything to say, better music and graphics products may reduce the need for technical skill, but they're no substitute for ideas. Says Rundgren, "Being a musician nowadays doesn't necessarily require a whole lot of musical talent. Same thing with visual artists—technique takes a back seat to so-called inspiration. Whatever it is you are trying to convey is the most important thing. When you're recording music the most important thing is the song—the technique by which you perform is secondary."

What impact have personal computers had on the work of musicians?
I guess the biggest impact that computers have had is the fallout of technology that was essentially digital and could be considered specialized computing in a certain way, like digital sampling computers, which essentially convert sound into numbers that can be stored and re-played out of a machine. Musicians are familiar with that as a kind of thing you have to have—some kind of sampling keyboard. This is a digital process that could only have been simulated originally with computers—you just get rid of all the hardware that you don't need and what you have left is an Ensoniq or Mirage or Fairlight or any of the other more or less expensive digital sampling keyboards. Also the DX-7 line of machines, which use digital FM synthesis.

You have to almost be something of a computer programmer to effectively operate a DX-7—they have so many interrelated parameters and things, they even use computer jargon like "algorithms"—each sound is the product of a certain algorithm, a combination of digital synthesizers. To effectively program a DX-7 you almost need a computer to translate—the problem being that the DX-7 has such a tiny little information window and you can't see all the things that are going on inside it. I think most people who do any kind of serious programming with DX-7s hook up a computer to the DX-7 and use that.

Do they buy commercial software or write their own?
I think you would usually buy a commercial package. For instance, OpCode Systems makes a number of packages—a DX editor for editing sounds and a DX librarian for saving sounds. Digidesign has a program for editing and saving sounds, I believe.

Digidesign also has an interesting internal format that they convert digital data they've collected from various instruments, so you can have samples from one company's particular synthesizer in a certain format and then transfer it to another company's synthesizer. Essentially they have a lot of different translators and a common format, so once you've got it into the Digidesign program you can pass sounds around. People can give each other disks of sounds that they've sampled, and they don't necessarily have to be sampled on the same instrument. As long as the Digidesign program has a translator for your particular instrument, you can have sounds that are sampled on any instrument.

> ***"Whatever it is you are trying to convey is the most important thing. When you're recording music the most important thing is the song—the technique by which you perform is secondary."***

Has MIDI facilitated the process of linking different instruments and machines?
That was the idea. It's a pretty cheesy keyboard nowadays that's made without MIDI. Manufacturers would find themselves at a competitive disadvantage with any keyboard without MIDI.

What that also forced to happen was that to take full advantage of MIDI, certain things had to be standard as well on the keyboard, like a velocity sensitivity and pitch bending and modulation and things like that. That all got more or less standardized, even though various keyboard manufacturers can devise their own devices—for instance, Yamaha has a breath controller that you plug into the DX-7. It's a little thing you stick in your mouth and blow into, and it can control various aspects of the playing dynamics. If you've got a trumpet-like sound, or flute-like sound, on the keyboard, then you can put those dynamics into it by blowing on it, the same way that a trumpet player or flute player would. You can more accurately capture the dynamics of a wind instrument.

So you can play your guitar, or saxophone or whatever it is you're adept at, and control synthesizers at the same time you're playing your own instrument. You can control elements for a whole band if you're just one person. There are some software programs now that allow the computer to improvise on things that you put into it, so you could be playing your instrument and the computer would be listening to it and devising lines of its own. There are programs that can determine what tempo you're playing at, and follow that tempo.

MIDI to most people—the average user who doesn't do a lot of recording or sequencing—MIDI is just more hands. In other words, you simply use one keyboard to control the input to any number of keyboards, as many as you can patch up. It also can allow you to move the sound-producing part of your synthesizer setup to a remote location, and all you need is one keyboard controller.

Why might you want to do that?
The purpose of doing that depends on your style as a performer—of course there were the Rick Wakeman/Keith Emerson days, where you were trying to impress people by stacking as much stuff up on the stage as possible. They figured people looked at it, and if it *looked* big then the sound was big.

Nowadays musicians aren't playing the Cow Palaces as much, and musicians who have to play smaller places want bigger sounds. So now if you wanted a wall of sound approach, rather than having to have a keyboard and a place to put it for each component of the sound, you can have very small modules—Yamaha makes a very small module that looks almost like a telephone answering machine, and it has a lot of the sounds that a DX-7 can create inside it. All you have to do is hook a MIDI cable into it, and you can stack them up as high as you can stack them. You could stack 20 of them up and it wouldn't be much bigger than a guitar amplifier, in terms of how much space it takes up. Whereas formerly you would have to have a keyboard, have to find a place for every single keyboard, and have to whip around playing all of them.

There was no MIDI when Keith Emerson and Rick Wakeman were hauling out their synthesizers. I think that's an advantage—space savings. You don't have a truckload of stuff to move from gig to gig, you only have a suitcase-load of stuff.

That's a great advantage, having all this compatibility between instruments and various new ways to produce sounds.

I don't need a synthesizer to make music, I try to keep that idea as much in the forefront of my brain as possible when I'm trying to create.

It's not any different than it ever was. It wasn't any different when the electric guitar became a popular instrument and everybody and his brother had one and most of them couldn't play it. It's the same thing with any kind of instrument—it doesn't matter how sophisticated a tool becomes, there will be people who will develop the skill to use it effectively and then there'll be people who just make noise.

Who are the winners and losers in the MIDI revolution?
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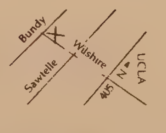

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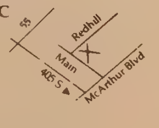

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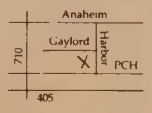

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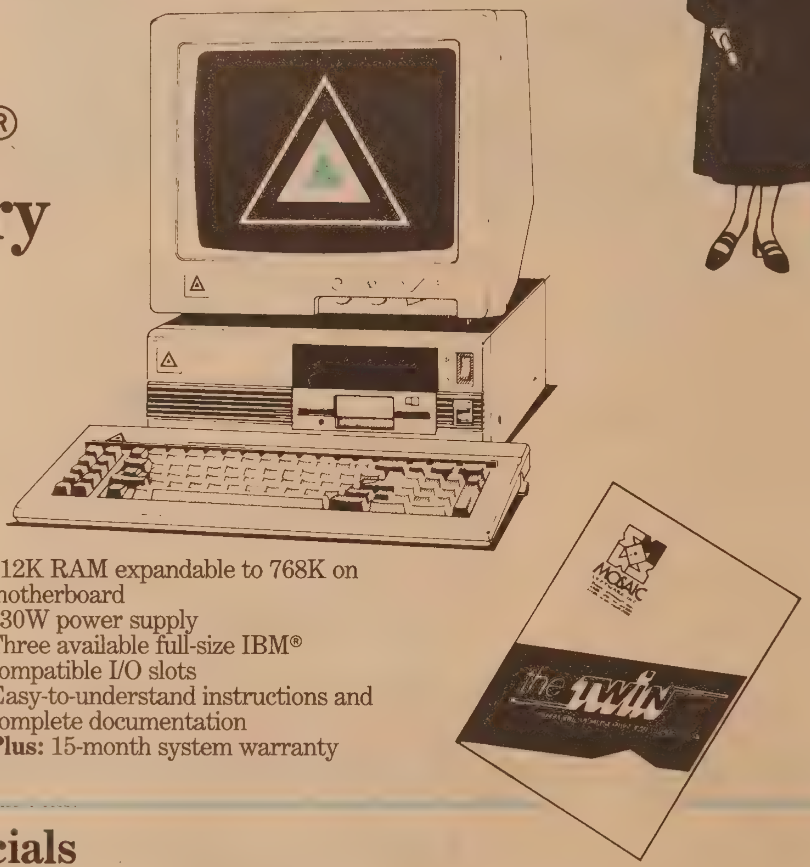

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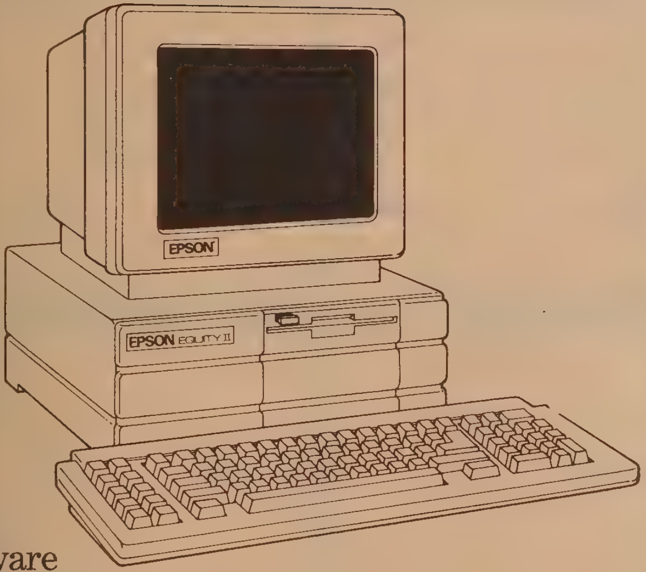

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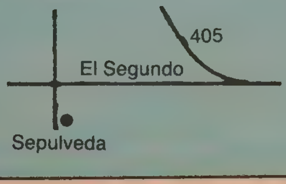

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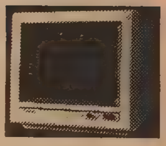

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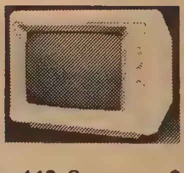

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iods, when there's a lot of new technology, new tools, new media of expression, the people who will lose out will probably be the listeners. Because there'll be a few serious people—the serious people are usually the ones who make the dilettantes aware of what's going on. And once the dilettantes become aware of what's going on, it becomes quickly devalued by a lot of unskilled labor. A lot of mediocre music, essentially, and so the people who listen to the music will be the ones who get the bad fallout. The dilettante is kind of like the surrogate listener—they'll fool around with it, but they don't really want to apply themselves to learning about this in any kind of comprehensive manner because they're dilettantes—they'll move on to the next trend once this one has been depleted. Whereas the people who will really get involved with these things—their curve is slower and longer and the depth of their involvement is much greater.

What about the complaint that all these computers are putting musicians out of work?
I don't think that really good, creative musicians have ever been out of work. That's the whole point. When you say musicians, there are a lot of people who call themselves musicians who make money off of music, but that's altogether separate from people who keep music a vital medium. The people who create the things that everybody else imitates and capitalizes on. It's refreshing that every once in a while some of the originators will make money off of their own creations [laughs]. There's such a rush to capitalize on something new that it's quickly devalued.

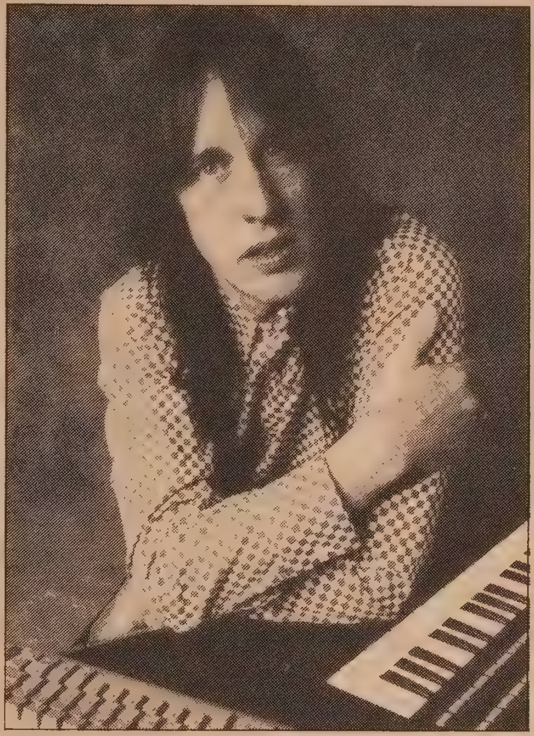
Onstage, you use an IBM compatible to control the music, but a Macintosh for the graphics. What's the difference between the two environments?
I was running *Texture* on an IBM, but I don't particularly like IBMs. I was running it on an IBM because it was written for an IBM. It was the easiest thing, because I'm not really into this whole sequencing business. To sequence a bunch of songs for me to take on the road and have the computer play is pretty much an ordeal. The easiest way I could get through the ordeal was to have Roger [Powell] help me with it. Roger wrote the program, so *Texture* was an obvious choice.

The IBM was made for the business world, and since I'm not a businessman I don't have much interest in their line of computers or the method of marketing. I'm really essentially involved in personal computing—I don't care what the business world does.

Everything in the IBM scheme of things is based less on a philosophy of computing than a philosophy of marketing. The only reason that the new IBMs have graphics and MIDI is marketing—everybody else has them and IBM is going to look pretty antediluvian if they don't.

There's always a lot of software for IBM, but it's the type that really defines the personality of the machine. There's such a great preponderance of business software, and the available programming tools are for people who want to write more business software.

IBM has never been interested in the casual user of computers, those who use them at home, or hackers—it's interested in people in a good solid rich dependable market, the business community. IBM wasn't thinking of me when they made the machine. Steve Wozniak [creator of the Apple II] was thinking of someone like me, the guys at Atari and Commodore are thinking of people like me more than IBM is.



> ***"I don't think that really good, creative musicians have ever been out of work. That's the whole point. There are a lot of people who call themselves musicians who make money off of music, but that's altogether separate from people who keep music a vital medium."***

The Macintosh user interface seems to get the programmers' creative juices flowing, it frees them from having to think about "How am I going to represent the interface in all this?" and gets them concentrating more on the wacky idea.

My essential involvement at this point in the computer field is assessment and design and making suggestions about interfaces. Particularly for graphics, but for anything, because I've been involved with the machines for so long and because I actually have applications for them. Since I've been involved in music production, since I've been involved in video production, and the application of computers in both of those fields, I have some understanding of how an interface should operate because I have an understanding of things that I want the machine to do.

Most people who write programs get so involved in coding that they never get a chance to actually use it in a practical situation. A lot of breakthroughs in terms of machine abilities come about because somebody's writing code and they suddenly discover a possibility. Unfortunately they don't know how to convey this to the user, and so I'm trying to look at it from the other end, to think of it constantly in terms of what is it that I want the program to do. Let somebody else figure out how to make it do that, because usually since I know about writing code and I know about data structures and things like that, I can make a little bit more reasonable demands, more coherent demands.

A user who doesn't have a lot of experience with machines won't even know how to go about telling somebody what it is they do or what it is they want, describing the process, before you can even integrate the interface of the machine with the process—creating pictures or making music or something like that. I guess that's the reason I'm in this position, because I have made pictures and music, and I also have written programs, so I understand that particular area.

What would you like computers to do that they can't do yet?
That's not an easy question. That's the essence of interface design, it isn't a patent thing.

There isn't a wall you've hit that you wish wasn't there?
The most frustrating thing, I think the thing that's held things back the most, is that there's no standard of input and output. MIDI is a standard, and that's been a big breakthrough in terms of computers, because MIDI is essentially a digital interface, so it's information that can easily be stored and manipulated inside a computer.

But the problem beyond that is that computers don't have the same bottom-line standards in terms of the graphics, the display standards, and things like that, so when people are designing interfaces they have to design three or four interfaces for all the major machines. In other words, if you were writing an interface for the IBM, you have to write it for the bottom line, which would be a miserable monochrome adaptor. But you don't want your program to be stunted, so you have another version that takes advantage of other things.

The Macintosh has only one kind of display, so anything you write for the Macintosh you only have to write one version. But if you're writing for the IBM, it's completely different from the Macintosh, and not only that, it's completely different depending on how much money you spend on your display card. It's essentially a conspiracy on IBM's part.

Things are getting to a standard, 640 × 480. That's a good thing and it should help move things along.

The reason things are behind is essentially proprietary things—IBM wanted to be able to make as much money as possible, so they made five different standards. And when they sold you the computer they didn't give you any of 'em. You had to buy one—when you bought the computer you couldn't see anything on it. Not only

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was the monitor extra, but the video card was extra, depending on how much video you wanted.

What do you find frustrating about existing interfaces?

Interfaces in general need work. They still require a certain amount of computer consciousness on the part of the user. Everyone has what they believe to be a philosophy of user interface, but usually it's coming from the wrong direction. It's usually 'we're capable of doing this, so we'll build a front end that allows us to control the things we're capable of.' That doesn't always conform to the attitude that the user has about the software.

A user has an understanding of the area that he's operating in. If someone wants to use a word processor, they already have a familiar metaphor for that—pencil and paper or a typewriter or stacks of pages.

So there is already a metaphor for that. A computer screen is flat and two dimensional, and a sheet of paper is also flat and two dimensional. When you start to get into other things where the metaphor is a little less flat, that's when people have trouble thinking up interfaces that make sense.

In order to free up the computer as an artistic tool, certain engineering concepts have to be built in. The artist doesn't want to have to worry about taking a ball-shaped object and throwing it at wall-shaped object, he doesn't want to have to play God and detect the point where the ball hits the wall and tell it explicitly to change direction. This has to be a result of natural physics. Very few interfaces have that built in.

With some systems I'm trying to be creative, but at the same time I'm spending equal or more energy trying to overcome limitations in the system. I suppose there is that aspect of any medium, but if I was just using a canvas and paints I would not be limited by the number of colors. I would only be limited in resolution in how small the brush was and how much control I had over my hands.

The reason I get involved in designing interfaces is that I want people to be ultimately doing those things. I want to make pictures myself, but I also want to see the pictures that other people make. Some other people have a more wacky visual sense, and I enjoy looking at those things.

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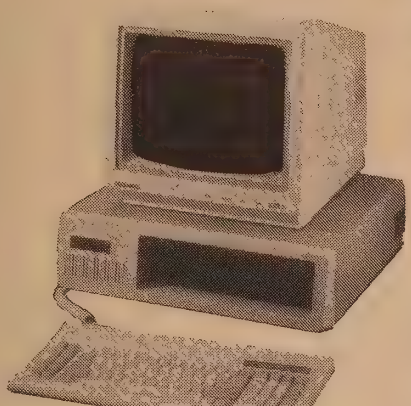

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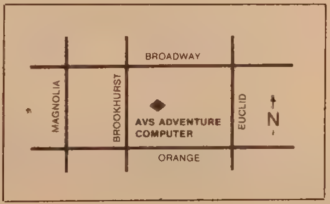

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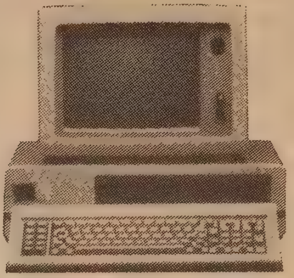

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Artists will seek tools that enable them to express their ideas with a greater degree of accuracy. After that, a technology will develop. Once the artist becomes familiar with that, he realizes other things that he wants. Then the technology has to catch up with that, and after that it makes demands on the artist again. The artist wants something, then the technology attempts to catch up, then the artist has to keep abreast of the technology again. It's a herky-jerky thing.

I'm involved in computer graphics, and I think what's happening now is that things are in kind of a woodshedding phase, because there are a lot of breakthroughs in terms of graphics that could be translated over into video production, and films, but we're at a point here where our reach is exceeding our grasp, and we have to work on the grasp part of it a little bit.

And that means standards?
It may eventually mean standards, fortunately or unfortunately. I mean, it's a tradeoff, standards are a tradeoff. They exist for a reason, obviously. They exist for the reason that every time there's an improvement in terms of capabilities, you have to relearn everything all over again, and it'd be nice if there were a standard that has enough room to grow built into it, that programs that took advantage of the standard wouldn't have to be rewritten every time a new capability was made available.

There are other theories that people including Apple are exploring at this point, because now that the computers that the average person can afford are becoming more sophisticated and can hold a lot more information—a lot more different, non-homogeneous information—there have to be more sophisticated ways of dealing with it. Hierarchical file systems—how do you maneuver your way through hierarchical file systems without getting lost or without it taking forever? There are limitations to nearly everyone's system at this point, and everyone's trying to figure out ways to overcome them. And nearly as soon as something becomes a so-called standard—Microsoft *Windows*, let's say—it becomes nearly obsolete. Because they were playing catch-up the whole time.

Is there a machine or software package you prefer for graphics applications? The Macintosh doesn't have color.
Well, there's no color, but there's also the new Mac which is standard in color and can handle color up to the resolution that is adequate for broadcast video capabilities. 640 × 480 is pretty much broadcast standard, and 24 bits of color. So there is an advantage to writing on the Macintosh —I'm writing on an old Macintosh now, in a portable language—C—so most of it will be translatable over to the other machine.

The other advantage is that a lot of what you write is not specifically what appears on the screen—a lot of what you write is behind the scenes, and any machine that facilitates that is going to have a lot of stuff written for it. With the Macintosh, Apple realized that if you give programmers things to make their job easier, then they will write a whole lot more software for your machine, and that will make your machine more appealing. And that was the smart thing that Apple did.

The measure of their support was that they put the toolbox ROM inside the machine. They gave you all of the common things that you would ever want to do. Very few other machines have that kind of sophistication. Amiga realized that of course that was the kind of thing you ought to do, so Amiga did it. Unfortunately Atari *didn't* do it, Atari left it to another program, and that's why software for the Atari has been so slow in

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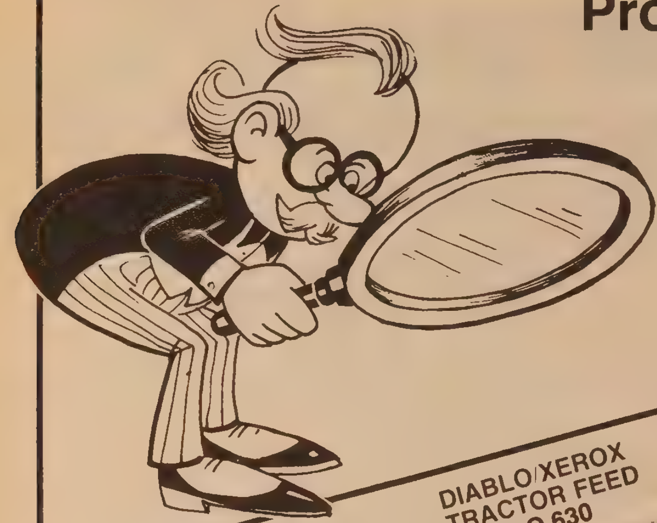

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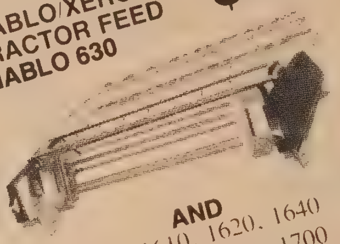

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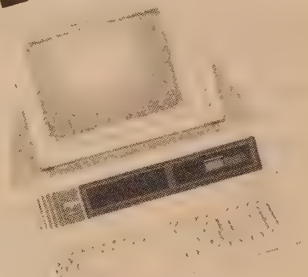

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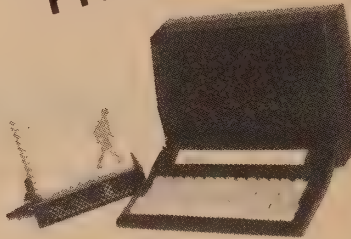

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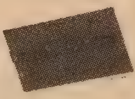

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coming and why performance on most of the software is very poor. Because programmers are required to write every routine, the bottom-line graphics display routines and things like that if they want them to be optimum performance. You have to start at point zero. There's no hardware in the Atari that will, say, draw circles or squares.

What kind of work are you doing in graphics?
I'm working mostly on the interface, something that gives the user a cogent way to describe what they want the machine to do. Someone else will do the algorithms and create the pictures.

And this is eventually going to turn into a commercial package?
It may. Hopefully. I don't really care if it's commercial or not. I mean [laughs] it'd be nice to have another source of income, but I'm not hurting.

So you're doing it mostly for its usefulness in your own work?
It's a hobby. Yeah, I'd like to have a tool that I could use, that I could express myself with. The problem is, I haven't found one yet that I'll put up with the frustration of.

It's the descriptive language. Most people have some kind of intuitive way of describing something. Like if you were directing actors, you would say, stand over here and walk to there and things like that, and the problem with most of the smaller systems is you have to reinvent the wheel every time you do this. You have to describe, you have to pick the actors, and the actors are not only ignorant of what you mean by walking, they're so ignorant that they are essentially not alive. You have to pick their feet up [laughs] and stuff like that.

You're no longer thinking about things like the overall look of how this works, you're getting into, how do I tell this guy to make that motion? And you don't want to have to get down to that level; you want to be able to say, fly over to there.

You want to at least have the primitives available to you. Most systems are shy on the primitives. Most systems are shy on even how to describe the primitives.

Is that because programmers don't know there's a need for this?
No, everybody knows there's a need for it, there's just a lot of theories, and limitations in the machines. That's why we can expect to see a lot of different approaches to these problems now that the higher speed of the new machines and the greater graphic sophistication will allow them to present these problems in a way that's a little more understandable. In other words, you can

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> ***"There are a lot of breakthroughs in terms of graphics that could be translated over into video production, and films, but we're at a point here where our reach is exceeding our grasp, and we have to work on the grasp part of it a little bit."***

have some kind of real-time interaction, and see what the results are going to turn out like.

Who's going to be using this technology?
I think the first people that you want to reach are the people who would do it if it was possible, but they couldn't afford it. A lot of creative people are shut out of the process because they don't have enough money. They don't have access to the tools.

It's not whether John Q. Public and his family are going to start turning out MTV clips, or anything like that, but it is whether 10-, 20-, 50,000 art students across the country would be spending a lot of time creating things with a computer if they could get their hands on one that was really aesthetically up to par and had the performance.

I think that's something that could happen. I think that a machine—say like the Macintosh II or any machine that could display that much information, had the right software on it, and was affordable—machines would be walking out the door for applications like that. The kind of software that I'm talking about would be general-purpose software—it wouldn't be just art students, it would be the engineers and graphics houses and anybody who would be using graphics in that sense.

I think there's a lot of partitioning in the graphics process which it'd be nice to get over. For instance, most architects are just as capable of doing a freehand sketch of what they want as they are of doing a drafting of what they want. And software they use ought to give them the tools they need to do a freehand sketch in the same way it should give them tools for architectural drafting.

And there's no reason an architect shouldn't want an animation of what was going on, in three dimensions. There's no reason why an art student wouldn't want an animation, just because it's—artistic [laughs]. So I think there has to be some protocol for describing animations and things like that, that everybody agrees to.

There'll either be standards set by some standards committee—and unfortunately the problem that happens there is standards committees are usually made up of representatives of various companies who have vested interest in the outcome, and they will argue for two or three years [laughs].

The other alternative is the de facto standard—in other words, some company comes up with a standard that's so popular that everyone else has to subscribe to it or else they're out in the cold. ☐

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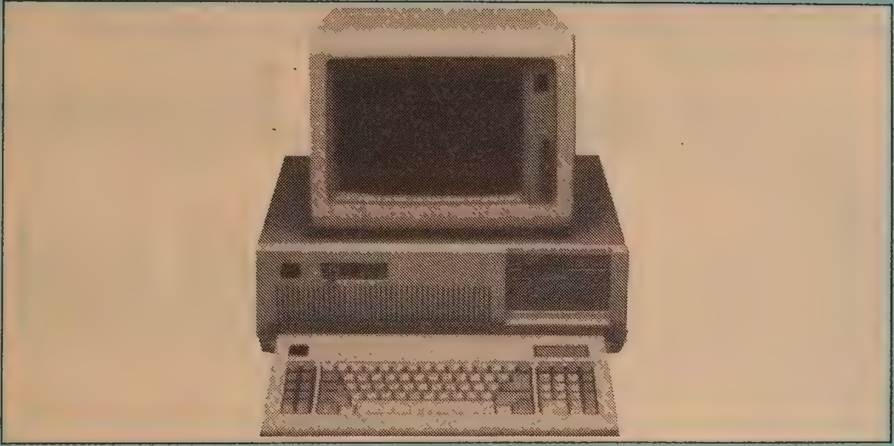

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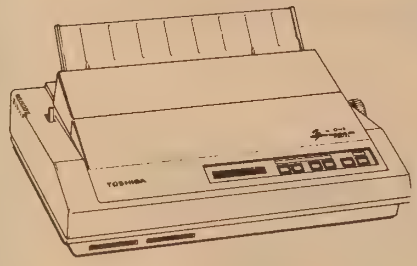

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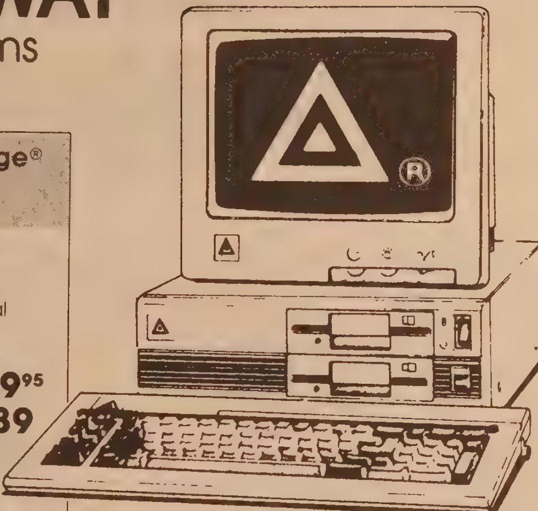

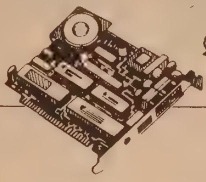

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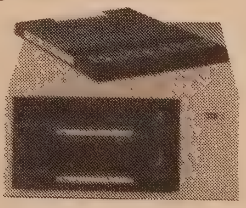

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First in a series of articles on music on the Macintosh

MIDI And The Macintosh: The Musician's Workstation

By Paul Craner

About three years ago, a specification for the transmission of digital information was formally announced. It differed from other communication protocols in that the information to be sent and received pertained to one thing, and one thing only: music. A few months later, in a totally unrelated development, a microcomputer was introduced which sported features that sounded more like a description of someone's home than a computer: desktops, windows, boxes, buttons, a few bugs here and there, and even a mouse! The communications protocol was called the Musical Instrument Digital Interface, or MIDI. The computer, of course, was the Macintosh.

Three years and several improvements later, the combination of MIDI, the Mac, and some truly elegant software offers the musical artist what had previously been available only to engineers, scientists, and superstars: a high performance, totally integrated workstation. Beginning with this article, we are going to look at the wonders wrought by the meeting of MIDI and Mac, at the specific software and hardware that made the meeting such an affordable success, and just how these elements work together to create a workstation for cultivating and exploring an artist's most precious resource: creativity.

THE WORKSTATION CONCEPT

Even to someone unfamiliar with computer jargon, the idea of a workstation is fairly self-evident: a place to work that allows all aspects of the task at hand to be addressed. For a musician, such a workstation must included a variety of software-based tools. First, the ability to capture a musical performance, played in real or step time, must be possible, or nothing else gets done. By **real-time** we mean a performance captured as it happens. By **step-time**, we mean a performance entered step by step, specifying the way the performance will sound—building it, as it were, piece by piece, to be played back later in real-time. Step-time entry allows for far more complex musical passages than otherwise might be possible, and for a great deal more control over when musical events take place. This first application of our workstation is known as **sequencing.**

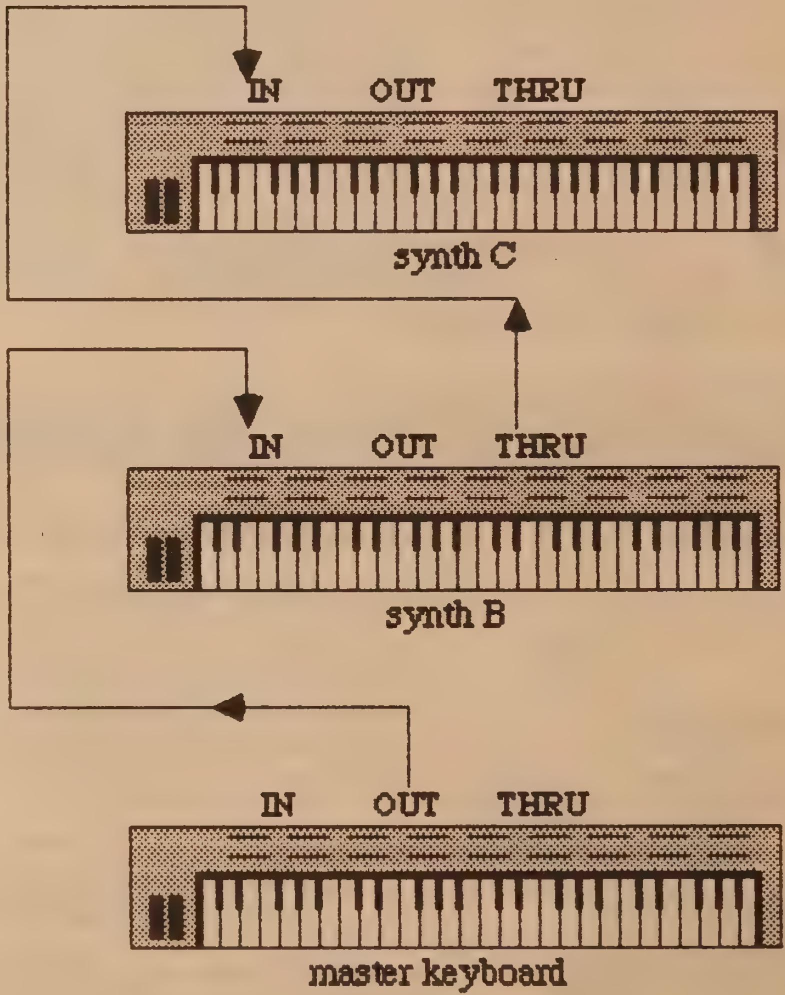

FIGURE 1: Daisy chain MIDI keyboard setup

> **The combination of MIDI, the Mac, and some truly elegant software offers the musical artist what had previously been available only to engineers, scientists, and superstars: a high performance, totally integrated workstation.**

The next important feature of our music workstation is a "music processor," having all the advanced features of a good word processor, only using the symbols found in common-practice musical notation. In addition, such a program must be capable of converting the music already captured by the sequencer into notation, with the idea being that a musician can play the part to be printed much more quickly than if s/he had to "type" it in. Such applications fall under the heading of **transcription/notation**. Any musician will tell you that getting either a moment of inspiration, or a carefully envisioned musical gesture, onto paper in such a way that another musician could re-create it is one of the most arduous and absolutely necessary aspects of the compositional process.

The conversion of a freely played performance into the static symbols of music is fraught with all sorts of problems. It's something like trying to "talk" a document into the computer, and expecting it to print out with all the correct punctuation, type-faces, centering of titles, and so on. Because such a perfect realization of what was meant is impossible, the ability to edit the results quickly and easily is an absolute necessity. (As a brief aside, it is sometimes suggested that Artificial Intelligence, or some other new whiz-bang breakthrough, will solve the last remaining problems of transcription, but I am not convinced. Even a fine musician, who is anything but "artificially" intelligent, would have difficulty in notating the

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kinds of complex musical gestures that are possible at our workstation. Indeed, in some cases the symbolic equivalents of certain musical ideas don't even exist. Yet for many kinds of music, the transcription process has proven itself quite useful, and, as we shall see, the Mac's "look and feel" is ideal for smoothing out the rough edges of this particular application.)

Once a musician has composed a piece of music, and perhaps printed out the various parts, the ability to choose different "instruments" to play the piece is obviously important. In addition, the musician must be able to adjust a particular sound to the needs of a particular work. For some pieces, a particularly bright piano sound might be best, while for others, a rather muted one might be more appropriate. The ability to manipulate the kinds of sounds the musician is working with is another feature of our workstation. Known as the **Editor/Librarian**, such a program allows for the analysis, editing, and storage, of the various parameters that affect the sound produced by a wide variety of synthesizers, samplers, drum-machines, and "effects" modules.

The last two features of our workstation involve the use of tools for enhancing the compositional process, and for the development and sharpening of basic musical skills. **Compositional algorithms** allow a composer to define various parameters to the computer for the purpose of generating musical excerpts, which can often be quite useful to a composer. For instance, the computer could be told, "Compose a twelve note phrase, beginning on middle C, and ending on the same pitch-class an octave higher, moving upward by the same interval for each step." This algorithm would quite predictably result in a chromatic scale. An algorithm such as, "Compose a twelve-note phrase, beginning on middle C and ending anywhere," would have completely unpredictable results. At its best, such software permits a musician to describe the kind of musical excerpt s/he is after, in ways that strike a balance between total randomness and total predictability. On the other hand, **Computer-Assisted Instruction**, or CAI, is designed to always have the same results: the steady improvement of musicianship. Such programs can range from ear-training/sight-reading drills and harmony exercises to learning how to play with a walking bass-line.

BEFORE MIDI

Before the introduction of MIDI, the kind of workstation we have just described could cost as much as a small house. There did exist a couple of "affordable" music set-ups, but they were geared primarily to the serious (if forgiving) hobbyist, and/or the educational market. The **alphaSyntauri** and the **Soundchaser**, both modeled on the workstation concept, use a pair of synthesizer cards that plugged into that immortal 8-bit workhorse, the Apple II. But these systems suffered from marginal sound quality, limited memory, timing problems, and software that did some things well, and other things not at all. Still, many musicians made good use of these "playstations," finding clever and unique ways of overcoming their inherent limitations. Even after the manufacturers of these products moved on to other things, add-on products like the **DX-1** sampling board and **The Interpolator** extended the life and power of these early systems, and many are still put to good use today.

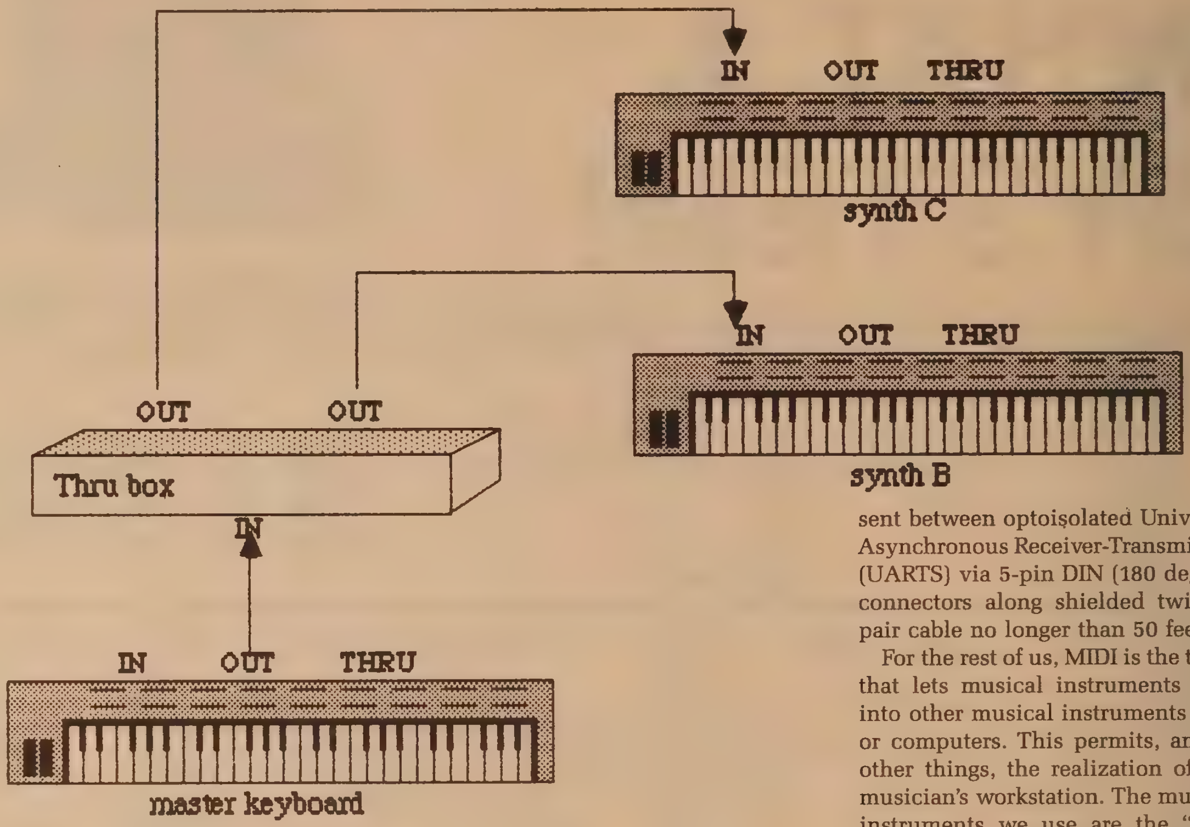

FIGURE 2: Thru box MIDI keyboard setup

MIDI data is a description of the performance, not an actual recording. In other words, what is transmitted is a series of commands or messages that can tell a synthesizer to do certain things at certain times.

Still, musicians knew so much more was possible. They kept one eye (and both ears) on their superstar counterparts (with their super-expensive set-ups), and dreamed of the day they could get their hands on such a workstation. The first step toward realizing that dream was MIDI. The step that has made that dream a reality is the Macintosh. But before we can talk about why, and how, and the specific software and hardware that brought MIDI and Mac together in such an elegant and powerful way, we need to look in some detail at the Musical Instrument Digital Interface.

MIDI

For those who don't like numbers, skip this paragraph. For those that do—the Musical Instrument Digital Interface operates at 31.25 (+/− 1%) Kbaud, asynchronous, with a start bit, 8 data bits (D0 to D7) and a stop bit, for a total of 10 bits in a period of 320 microseconds per serial byte, sent between optoisolated Universal Asynchronous Receiver-Transmitters (UARTS) via 5-pin DIN (180 degree) connectors along shielded twisted-pair cable no longer than 50 feet.

For the rest of us, MIDI is the thing that lets musical instruments plug into other musical instruments and/or computers. This permits, among other things, the realization of our musician's workstation. The musical instruments we use are the "electronic" kind, specifically those that are themselves controlled by microprocessors internally, like most any synthesizer or drum-machine on the market today. Once the MIDI connection is made, what gets communicated depends on the application. In the case of sequencing, easily the most popular of the applications possible, it is information about a musical performance, such as when a key on a synthesizer is being pressed (**Note On**), when that key is no longer being pressed (**Note Off**), how quickly the key was struck (**velocity**), if the sustain pedal was pressed (**Control change**), and so on. Such information is "time-stamped" as it is received by the computer, so that an accurate representation of the performance can be stored in computer memory. With the right software and right computer, the "playback" will be indistinguishable from the original.

Keep in mind that MIDI data is a description of the performance, not an actual recording. In other words, what is transmitted is a series of commands or **messages** that can tell a synth to do certain things at certain times, such as "play a note," or "release a note," or "move your pitch-bend lever halfway up." Because of this, many things are possible that are impossible with analog tape-recording (which this application is often too strictly modeled after). For instance, it is a simple thing to have our description sent to a synth at twice the speed received. Unlike the "munchkin" effect you would get if you, say, played a tape-recording at twice its normal speed, MIDI se-

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quencing leaves the pitches the same, just plays them twice as fast. In fact, because our description is a numerical one of discrete values, virtually anything that can be done to a number can be done to our description. If we added the number 12 to every byte representing a note, we would hear a playback an octave higher, for in MIDI each increment in such a value represents a pitch one half-step higher. Also, because we are only sending a description of the performance, we can set the receiving device, our synth, to play a completely different sound than we used originally. This permits a musician to re-orchestrate a piece of music instantly, and often.

CHANNELS AND MODES

When the receiving MIDI device gets a sequence of MIDI commands, it will either carry them out, or ignore them, depending on two factors: the "channel" the sequence of commands is set on, and the "mode" the receiving device is in. The MIDI specification requires that the commands be sent over one of 16 MIDI channels, as a way of directing those commands to a particular destination. The synth "knows" if such "channelized" commands are meant for it by being in a particular mode. When a synth is in Mode 1 (commonly called "Omni Mode), it will respond to a sequence of commands no matter what MIDI channel they are being sent on. When a synth is in Mode 3 (commonly called "Poly" Mode), it will respond only if the channel the commands are sent on match the one channel (called the Basic Channel) the synth is set to. So what happened to Mode 2? Well, it's with Mode 4, and we're going to leave them until our next article, when we talk in detail about sequencing.

Whether the receiving device actually responds to the commands or not, the synth immediately sends a copy of the incoming sequence of data to its THRU connector. This allows a musician to "daisy-chain" his/her keyboard set-up by connecting the OUT of the sending device (which could be a computer or what is called the "Master Keyboard") to the IN of the next synth in line, which in turn has its THRU connected to the IN of the next synth, and so on (see figure 1). In this way all possible receiving devices get to look at the stream of commands being sent over MIDI. Since MIDI allows for sixteen channels, it is conceivable that such a chain could be made to sixteen different synths. But the data stream can become "distorted" if sent THRU more than a few synths. Other methods have been worked out to accommodate large set-ups, notably one where the OUT of the sending device is split up immediately into multiple OUTs through a device known as a "Splitter" or a "Thru-Box," then plugged directly to the IN of the receiving devices (see figure 2). Either way, the Channel/Mode combination allows a musician the kind of control we would expect in our workstation. By setting all the synths in a set-up to Omni Mode, a single key press on the Master Keyboard can trigger the sounds on all other keyboards at the same time, permitting a nice, "fat" sound. If, on the other hand, the musician wants each keyboard to play a completely different part, then s/he sets the various keyboards to different basic channels, and directs the sequencer to channelize the notes accordingly.

SYSTEM MESSAGES

In addition to Note On and Note Off type commands (known as **Channel Voice** messages) and Channel/Mode commands (known as **Channel Mode** messages), there are other types of data sent and received over MIDI. These are called **System** messages, of which there are three types. **Common** (actually the least common of these System messages), **Real-Time** (which, among other things, maintains a continuous 24 pulses per quarter note timing reference to keep all devices "in sync"), and **Exclusive** (data used by only one kind of synth for its own "exclusive" purposes). The typical use of an exclusive message is to transfer data pertaining to a synth's front panel (the settings that determine the kinds of sound produced), or to send a stream of numbers which represent the discrete values of a digitized sound (the kind of format a sampling keyboard uses). These are the kind of messages used by the editor/librarians of our workstation. The nice thing about exclusive messages is that they are proprietary and can be used by various manufacturers in almost any way they choose. This, along with other undefined "gray areas" in the MIDI spec, allows software and hardware developers technological elbow-room, and helps to keep MIDI a rather dynamic specification, being put to uses that few had originally envisioned.

NEXT STOP: THE SEQUENCER

To those of you still with me, congratulations. You now have a solid overview of what MIDI is, and maybe just as importantly, what it isn't. In our next article we will look at the software package that has become the industry standard for software-based sequencers, and why it couldn't have been written for any other computer than the Mac. ☐

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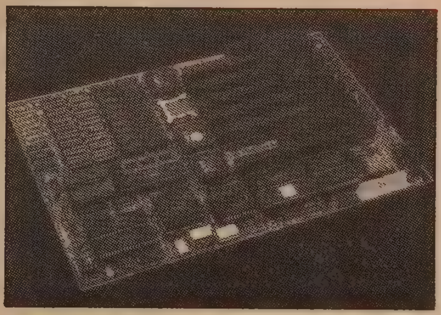

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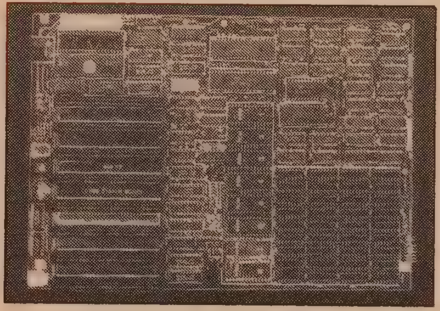

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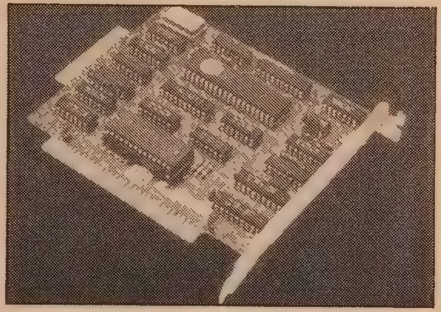

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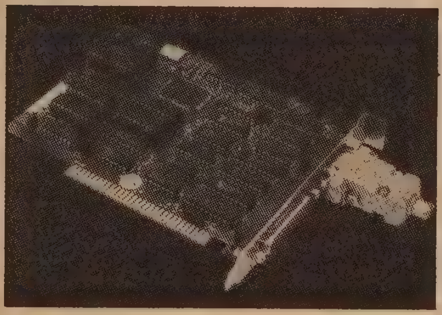

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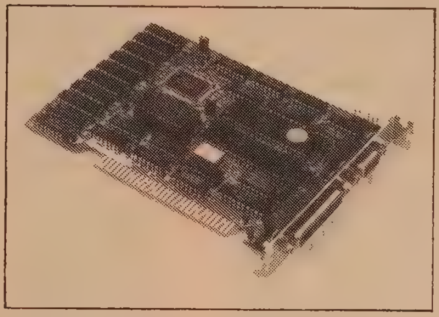

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Cruise Control

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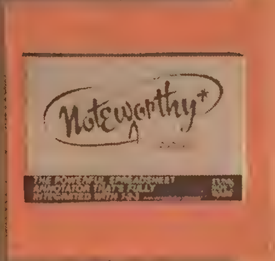
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Noteworthy

Noteworthy is the first spreadsheet annotator to combine professional editing and time management features with speed and easy use. It's fast and powerful because it's fully integrated with Lotus 1-2-3. With Noteworthy you can: Create on-line spreadsheet documentation, to remind yourself or to explain to others. Keep track of what's been done and what's left to do for spreadsheets-in-progress. Make cell-by-cell help screens for people who enter data into spreadsheets you design. Noteworthy was developed using software tools supplied by Lotus themselves. That means true integration between 1-2-3 and Noteworthy.

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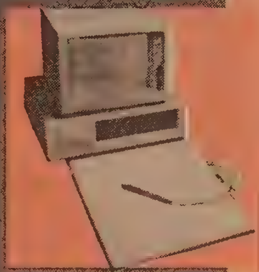

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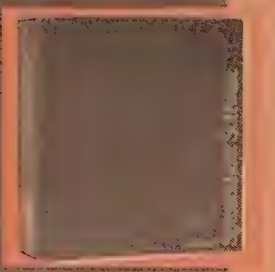

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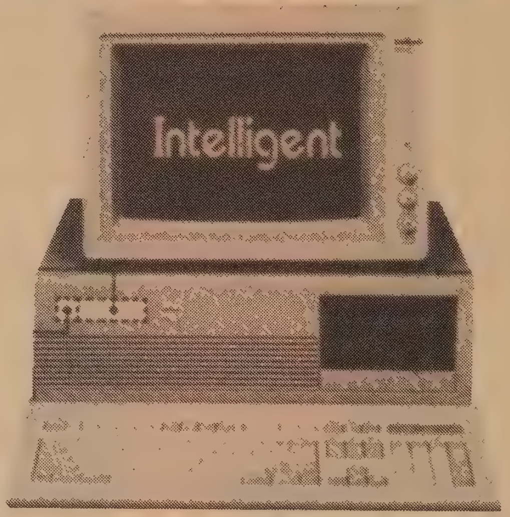

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computers & music

Passport Designs And The Evolution Of MIDI For Micros

By Kristen R. Coston

PHOTO: MARY EISENHART

Dave Kusek of Passport Designs, a pioneer and leading developer in the MIDI field.

Music software has come of age. More accurately, it leaped from infancy straight into young adulthood, skipping the sharp pangs of adolescence.

Thanks to the development of MIDI (Musical Instrument Digital Interface) hardware for microcomputers, music software is no longer just a toy, but a powerful tool that measures up to professional expectations—a sound investment that can save musicians lots of time and money. Even non-instrumentalists can use computers to manipulate and "play" their ideas for them. And anyone who's gone shopping for MIDI hardware or music software has probably encountered Passport Designs.

One of the world's leading music software publishers, Half Moon Bay-based Passport Designs pioneered the microcomputer MIDI market in early 1983. With the MIDI interface, you can hook up any MIDI-equipped musical instrument to your micro, and then use music sequencing, scoring, voicing and printing software to turn your setup into a complete MIDI studio.

Passport was founded in 1980, before MIDI was born, by Dave Kusek and John Borowicz. (Both were previously with Star Instruments, the drum synthesizer company that created *Synare*.) In 1981 Passport's first product, *Soundchaser*, came to market. This early music system, designed for the Apple II, consisted of both hardware and software. "We had to design everything," says Kusek, president of Passport. The hardware included a musical keyboard, an interface for the keyboard, and a synthesizer card that plugged into the computer. The software let you compose and manipulate chord voicings and melody lines, and included an educational ear-training program and a musician-level music printing program called *Polywriter*. You played back your compositions directly from the computer.

Soundchaser's playback capabilities were confined to the dubious sound quality then achievable on the Apple II, so its market success was limited to the computer and educational communities. "It just didn't have that sound quality that professional musicians were used to," notes Kusek. But though it fell flat in the music community, *Soundchaser* was valuable there because it was "a very specific way of connecting one type of instrument to one type of computer. And some of the work that we did certainly opened some people's eyes that you could connect an instrument to a computer and do things."

MIDI was not conceived by Passport; it was created in answer to the cries of professional musicians for a way to connect two synthesizers and play them both from one keyboard. The idea of an interface to achieve this end was formally articulated in 1982 by Dave Smith and Chet Wood of Sequential Circuits in a paper presented to the Audio Engineering Society. It was then a short step to getting major synthesizer firms, such as Yamaha, Roland and Korg, to cooperate by giving their stamps of approval and developing applications. By 1983, MIDI was a market reality.

With MIDI, you don't need to know how to program, and you don't need to be an expert sound-mixer or a great performer. All you need are ideas and a desire to make music.

Passport was the first software company to enter the MIDI revolution, with a MIDI device for connecting musical instruments to microcomputers. Working with synthesizer firms in Japan and the US, Passport designed what is now the industry-standard MIDI for micros. The firm's first MIDI products were created to support Yamaha's DX-7 synthesizer, and Yamaha, in turn, opened up a wide distribution network for Passport products. These products included Soundchaser-like software with greatly enhanced polyphonic capabilities.

MIDI micro ports can't be beat for their speed and efficiency. They free musicians to concentrate on making music rather than on tedious audio setup or manual composition methods. Kusek points out, "MIDI really makes it easy. Now you can buy all this off-the-shelf stuff and connect it together, without any technical acumen—the more the better, but you really don't need a lot." You don't need to know how to program, and you don't need to be an expert sound-mixer or a great performer. All you need are ideas and a desire to make music.

MIDI brought about an explosive growth rate in the electronic keyboard market—a rate that's fluctuated between 30 and 80 percent for the past five years. For Passport, MIDI was the key to success; according to Kusek, "MIDI created a market that was about 50 times as big as the market for *Soundchaser*—overnight" because that market now extended to musicians as well as to computer hobbyists and education.

All of Passport's projects have been self-funded, and the firm does all its own marketing. Kusek advises that although MIDI for micros is still a niche market, "There's a lot of money to be made in music software . . . it's a new vertical market that really is untapped, and if there's anybody out there looking for a vertical market to go after that's not business-related and is a lot of fun, music is a really good market." Many dealers are finding that music software is a valuable sales tool for MIDI hardware, and vice versa.

Predicting the next quantum leap for computers and music, Kusek explains that while MIDI is an electrical and physical standard, there is still no corresponding standard for a file format to describe a MIDI song. "What we're trying to do is to boil it down to one standard file format called a MIDI file, which would be a machine-readable form of MIDI. . . . a sequencer could write that file, and you can take that disk and load it into your music printing program and read the file and display it as notation, and edit it a little bit." The file could be rewritten, and then loaded into your performing program and read by it, and "all of a sudden now you've got a performance that is the result of several pieces of software kind of massaging that data." Kusek adds, "That's a major leap in the evolution of music software that's about to occur—this summer." ☐

Passport Music Software

Passport offers a full line of sequencers, printing systems, voicing systems and educational products, all of which interface with most microcomputers through Passport's industry-standard MIDI.

Master Tracks Pro, Passport's impressive sequencing software for the Macintosh, lets you record and graphically edit 64 tracks of real-time or "step-time" (note-by-note) input. Meter, beat and tempo data are stored in a separate, "conductor" track. The package includes a system-exclusive "librarian" program that gives you complete control over your entire MIDI setup, and a keyboard control mapper, which lets you control the sequencer from a musical keyboard by assigning capabilities like play, record, fast-forward and rewind to keys of your choice. The Mac environment, with its windows and pull-down menus, lends itself to a sequencing program such as Master Tracks Pro because all data can be edited in graphical form.

Watch for the release of an integrated composing and printing program that prints *Master Tracks Pro* files in standard music notation, and for a file transfer utility that converts files to and from other MIDI file formats. Also on the way: *Master Tracks Pro* for the Atari ST.

For the IBM-PC and compatibles, there's *Master Tracks PC*, a phase-oriented 64-track MIDI sequencer and step editor for the professional composer and performer. The program gives you a free-form approach to composing music, which means you can shape and mold your ideas at your own pace, constructing and rearranging phrases of any length.

Master Tracks is also configured for Apple and Commodore computers, offering all the benefits of *Master Tracks PC* (except windowing) with 16-channel unlimited track recording. It lets you orchestrate your songs as well. Master Tracks Pro for Apples and Commodores includes a live solo/mute feature on each track and expanded memory up to 325,000 notes.

MIDISOFT Studio is a low-cost, full-featured 32-track sequencer for the ST. This "recording studio" lets you make demos, compose songs, or just jam. Laying down multi-track sequences is easy because all the info you need is right on the screen, telling you what tracks are playing and what instruments you're using. "Transport" controls (fast-forward, rewind and pause) let you move quickly through the piece to record or play from any point. *MIDISOFT Studio* includes capabilities for real-time recording of events or "step-recording" of individual tracks.

Other Passport MIDI software includes the popular *Polywriter* music printing program, for the Apple; *The Music Shop for MIDI*, integrated sequencing and printing software for the Commodore; *MIDI Song Albums*, an entertainment series for Apples and Commodores; *Passport MIDI Voice Editors* for Yamaha's FB-01 synthesizer on PCs, Apples and Commodores; *Passport MIDI Voice Librarians* for Macs, PCs, Apples and Commodores; *Music Tutor* educational software for the Apple IIe; and *MIDI/8 Plus* and *MIDI/4 Plus* sequencing software for Apples and Commodores.

Most recently, Passport has hit the desktop publishing market with *Score*, for the PC. Slated for release in June, this sophisticated program lets you input, edit and print at engraver quality any piece of music you conceive — in a completely user-definable format. *Score* is compatible with most printers, and will print at a resolution of up to 4,000 dpi.

For more information, contact Passport Designs, 625 Miramontes St., Half Moon Bay, CA 94019, 415/726-0280. —*Kristen Coston*

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Music On The Amiga

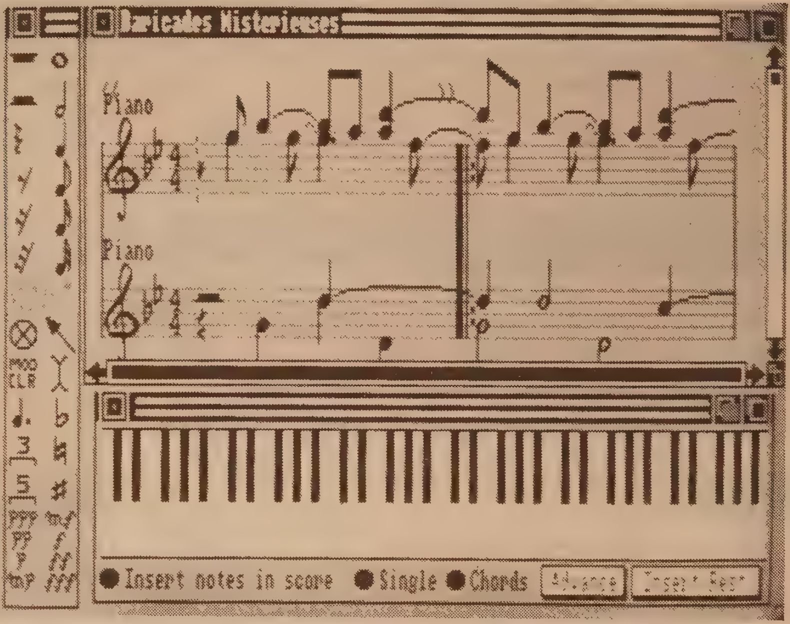
By Ben and Jean Means

The lights are dim...the crowd hushed. A computerized logo drifts across the giant video screen as a chorus of synthesizers begins to play. The lights come up as the logo dissolves into geometric multi-colored shapes, swirling about in the ebbing dark. As the singer steps up to the mike, his image appears magnified on the screen. The shapes cluster about him in the shadows, then explode into showers of color. A dream landscape appears, and as he sings and dances, it slowly shifts colors. He finishes singing and suddenly his giant image on the screen freezes...then bursts into sparkling points of light. The lights fade to black as the audience erupts with thunderous applause, and a lone computer waits for its next task.

This entire show could be run by one Commodore Amiga 1000 computer, using currently available software and hardware. The lights, synthesizers, sound effects, mixing and animated video effects combined with live action could all be controlled from a single Amiga running everything at the same time. This is the miracle of multi-tasking, the ability of one computer to run multiple programs simultaneously.

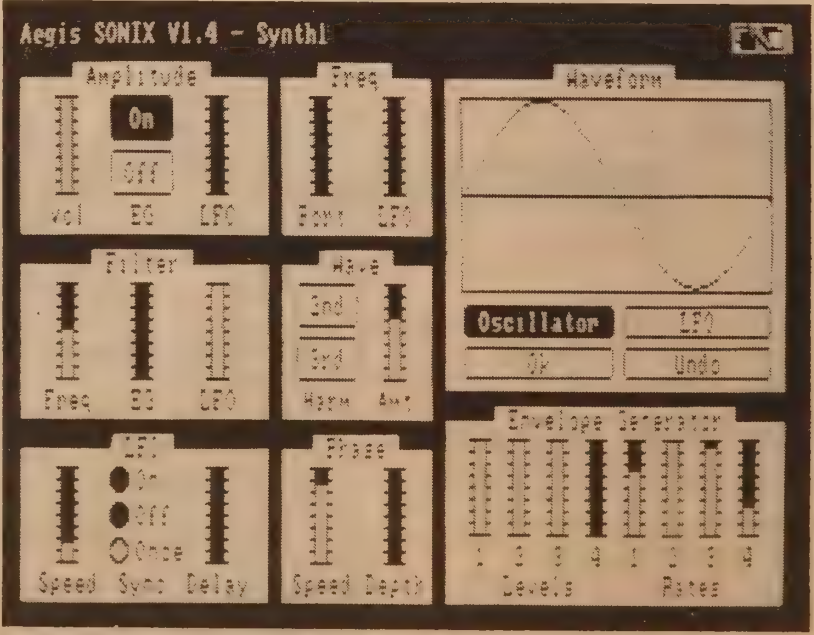
The Amiga is an amazing computer for both music and video. It offers 4,096 colors, four eight-bit internal voices with stereo output, a speech processor, up to nine megabytes of memory expansion, and three Very Large Scale Integration Chips (VLSI) which let the Amiga fly swiftly through the nanoseconds. The Amiga's unique Genlock option ($295) allows you to mix color computer graphics with live action. And among PCs, only the Amiga has the multi-tasking capability to make the home music and video studio no longer a dream, but a concrete reality.

The new Amiga 500 has the same features as the 1000, and it's only $649. The new Amiga 2000 ($1499) has seven internal expansion slots for plugging in IBM AT cards and a special CPU slot for MC68020 or MC68881 cards.



Deluxe Music Construction Set lets you compose, edit and play back music, which can then be printed as sheet music, transferred through a sequencer, or played on MIDI instruments.

> Among personal computers, only the Amiga has the multi-tasking capability to make the home music and video studio a reality.



Sonix from Aegis is a fully programmable software synthesizer with a simple notation editor for scoring.

LET THE MUSIC BEGIN

The Amiga wasn't a viable music computer in the past due to a scarcity of music software, but that is no longer true. The Amiga now has exciting, worthwhile products for both the amateur and professional musician. Here are a few examples.

SOUNDSCAPE, by Todor Fay of Mimetics: *SoundScape* is a professional quality MIDI sequencing program, but it's more than just another big music program. It's a huge program, and it threatens to get ever larger, because it's really not a program at all. Think of it as a UNIX for music, a complete music operating system. *SoundScape* creates a multitasking environment where little musical programs called modules are hooked together to build your own custom MIDI music studio.

SoundScape's open architecture is amazingly flexible and infinitely expandable. Even amateur C programmers can develop modules for their own special musical needs with Mimetics' Developers Kit ($149).

SoundScape currently consists of a sequencer (called Pro MIDI Studio 1.4, $149), a Sound Sampler ($99), and a MIDI Interface ($49).

The Pro MIDI Studio breaks the 8-, 16- or 24-track limit; it can record on an *unlimited* number of tracks which can be looped, quantized, edited and copied. There are also four special effects track modes; unlike most sequencers, Pro MIDI Studio lets tracks stop or start at any time, which allows layering of any number of simple or complex time signatures.

Modules are installed as easily as booting a disk into the Studio's Patch Panel. The first *SoundScape* utility disk of modules ($49.95) includes power modules like Mouse Bender, which gives mouse control over pitch bend, vibrato and other MIDI functions. The Mapper/Splitter translates any MIDI input into any MIDI output on any channel; this replaces hardware mapping devices costing hundreds of dollars and supports unlimited maps and splits.

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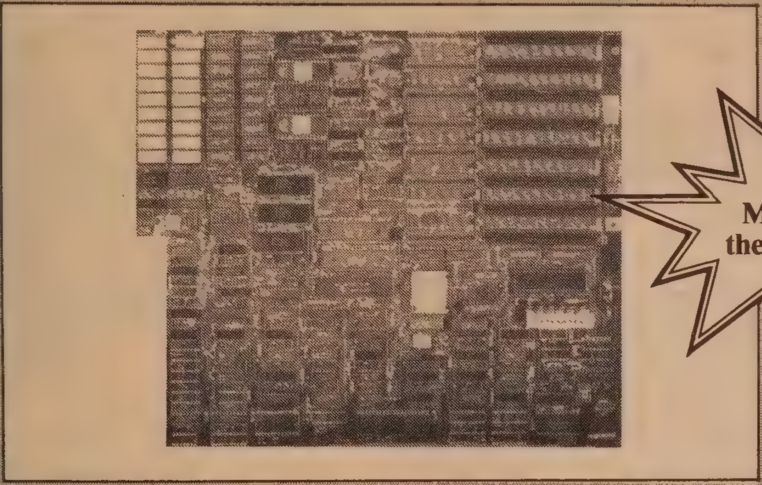

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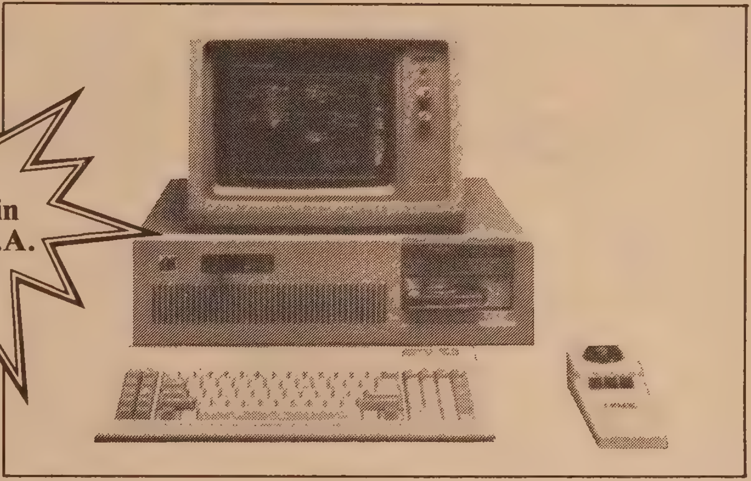

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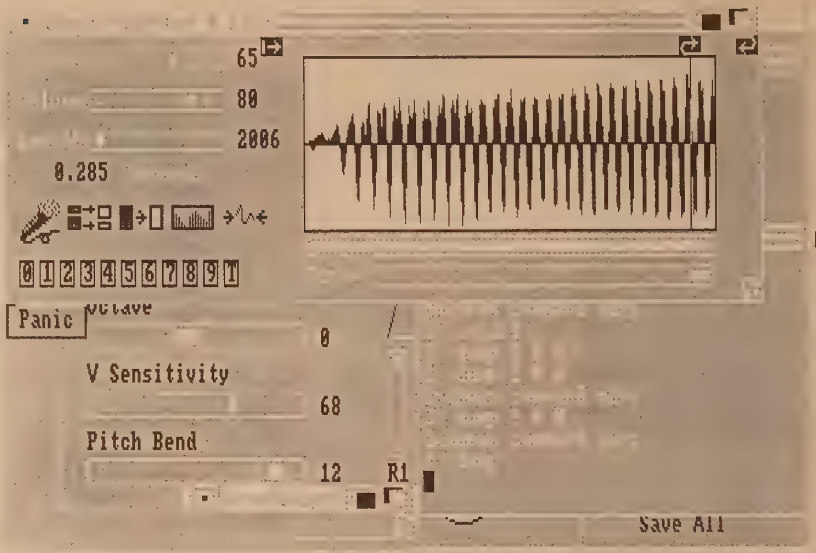

The Sound Sampler in SoundScape turns the Amiga into a four-voice, eight-bit companding sampler.

Many more modules are being developed.

The Sound Sampler turns the Amiga into a four-voice, eight-bit companding sampler. You can sample one sound into each of MIDI's ten octaves. Since there are 16 MIDI channels, you can have up to 160 samples on board at one time. Your samples can be extensively edited in the oscillograph wave form display, and the sampled playback can be modified with a DX-7-style envelope generator. In other words, you can easily build your own sound library in which the sounds of banging kitchen utensils and pulling your cat's tail can become beautiful (or at least esoteric) instruments. Samples can be stored either in IFF or Mimetics formats, or you can buy disks of samples from Wavetable and E.C.T. Sampleware.

SoundScape will never stop growing: when other music programs have reached their peak, *SoundScape* will outdistance them by sheer size and unlimited flexibility.

DELUXE MUSIC CONSTRUCTION SET by Geoff Brown of Electronic Arts: *Deluxe Music Construction Set* (DMCS, $99.95) is a full-blown professional notation editor; you can compose, edit and play back music written on up to eight staffs. Your finished score can then be printed out as sheet music or transferred to a MIDI sequencer for overdubbing. *DMCS* accepts songs from *SoundScape, Instant Magic, Sonix* and other Amiga programs that use standard SMUS files, then prints them out with lyrics. You can play your *DMCS* scores with the Amiga's internal voices and also with MIDI instruments using up to 16 channels. *DMCS* can also be installed in *SoundScape* as a module.

TEXTURE by Roger Powell of Magnetic Music: *Texture* is a down and dirty sequencer. It isn't fancy and it isn't cheap, but it *is* one hell of a songwriting tool. It doesn't use Amiga voices, it doesn't use the mouse, but it turns the ideas in your head into complete songs faster than any other sequencer we've used.

The basic idea behind *Texture* is that notes are recorded into patterns and patterns are assembled into songs. While a pattern is looping, you can record on any of its 24 tracks, and you can copy, block move, transpose, quantize, filter and set changes in tempo, dynamics and articulation *without ever stopping*!

Best of all is the record buffer, which solves the problem of the perfect take forever lost. You can improvise over a looping pattern with all your wildest ideas until your creativity starts to ebb. Then, invoke the record buffer which has stored all those brilliant takes; you can audition each take and save the best ones to their own tracks. Another prime feature of *Texture* is the Undo function, which lets you proceed fearlessly through your wildest imagining, and safely returns your original data if your imagination goes awry.

Texture ($295) uses the Roland MPU-401 Interface ($295) and the MIF-AMG adaptor ($125). The MPU-401 provides a metronome and FSK tape sync, which allows you to record multiple overdubs to a multitrack tape deck in perfect sync. It's expensive, but it's worth it.

SONIX by Mark Riley of Aegis Development: *Sonix* ($79.95) is a fully programmable software synthesizer with a simple notation editor for scoring. Many other software synths use additive synthesis, which is a sophisticated way of stacking harmonics. But it usually doesn't work well on home computers, and ends up sounding thin and reedy. In contrast, *Sonix* uses subtractive synthesis, which fools the Amiga's digital sound chip into thinking analog, so *Sonix* sounds very warm and pleasing.

Sonix is easy to learn, but it's more than just a toy. It's an educational tool with a 244-page manual, which provides a home study course in music theory and analog synthesis. You can teach yourself patch programming by fiddling with the oscillator, filter, amplifier, harmonic generator, envelope generator, phase shifter and low frequency oscillator. The variety of sounds you can create is endless, from synth whales and sitars to Chinese gongs.

Sonix can use these great sounds you've created to play back scores written in the notation editor with the Amiga's four voices, as well as output four additional parts over MIDI. So the Amiga can conduct an eight-part symphony with just a click of your mouse.

INSTANT MUSIC by Bob Campbell of Electronic Arts: *Instant Music* ($49.95) is for everybody. It's a techni-colored musical dream where there are no wrong notes. Boot up *Instant*; the music begins to play. Start moving your mouse up and down...you've just learned how to mousejam. The worries and cares of the day just disappear as you sit watching the mouse paint out your parts in glowing red, green, yellow and blue notes.

Instant Music has 63 different songs from Avant Rock to Beau Bop to Boogie Woogie. And all are designed to chase away the blues as you change 'em, rearrange 'em and save 'em as a soundtrack for *Deluxe Video*. And when you're ready for new mouse adventures, you can port over a whole music history of songs from "It's Only Rock and Roll."

"It's Only Rock and Roll" ($29.95) traces the roots of rock and roll in 40 songs that span a time period from 1956: Early Rock to New York 1977: New Wave; all these songs can be played with digitized instruments from fiddle to fuzz guitar.

MUSIC MOUSE by Laurie Spiegel for Opcode Systems: *Music Mouse* ($79.95) is an intelligent form of mouse jamming. You don't need music theory or keyboard skills, and you can't store what you play. But you can generate sophisticated four-part harmonies with the internal Amiga voices or with information sent out over MIDI.

The mouse creates music on a grid of four instruments that are played across vertical and horizontal keyboards. You can select different scales from pentatonic and diatonic to Middle Eastern from the QWERTY keyboard, as well different tempo and fill patterns. Then just let your mouse jam intuitively; it is guaranteed to sound original. If you like avant rock a la Philip Glass, you're going to love Music Mouse.

CONCLUSIONS

But that's only half the story. While the Amiga is playing your song, it can simultaneously run full color animations Genlocked with live action. So sitting at home alone in your bedroom with only the soft light of your color RGB monitor, you are the director of your next MTV video. We'll look at Amiga video products in a future article. ☐

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RESOURCES

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Life With A Macintosh SE

By Jim Wolcott

Now that it's been a couple of months since Apple held its gala, million-dollar invitation-only party to introduce the Macintosh SE and the Macintosh II . . . now that images of those computers have leered at us, Cyclops-like, from the cover of every Macintosh magazine . . . now that every Macintosh loyalist has decided when, and how, and what vices they'll give up to pay for their new Macintosh II (when available) . . . it's probably time to shed a little light the one new machine that *is* available. You know . . . the other one. The one everybody *isn't* talking about. The Macintosh SE.

There's a lot *not* to talk about. The Macintosh SE looks roughly like the previous Macintosh Plus. It's still built into a sealed box. It still uses the same connectors for the printer, modem, and SCSI port. But the Macintosh SE . . . well, it looks funny. Worse, it's shipped with a doorstop-shaped mouse that will be a foreign object in the hands of a seasoned Macintosh user.

What's the new machine really like? Is it faster? How do the new features relate to the average user? Does the SE run all existing software? Most importantly, does the SE represent a step forward for the Macintosh family, or is it Cupertino's Platinum Placebo?

The Macintosh SE is expected to become Apple's mainstream business machine.

THE NEXT-GENERATION MAC

For openers, the Macintosh SE is an entirely new computer: though similar in appearance, the only parts it shares with the Macintosh Plus are the CRT video display and the internal floppy-disk drive. The case, the keyboard, the mouse—even the *color* is new. In the past, Apple has offered "upgrade packages" for the Macintosh, so that older Macs could be retrofitted and brought up to the latest specifications. No more. The Macintosh SE represents a departure point: an entirely new generation of Macintosh computers.

The Macintosh SE is available in two configurations: either with two 800K internal floppy-disk drives, or with a single 800K floppy drive and an internal 20 megabyte hard-disk drive.

While the machine looks much like older members of the Mac family, one of the prominent clues of internal differences is the absence of cooling vents on top of the Mac's cabinet. The SE is fitted with an internal squirrel-cage fan, mounted just to the rear of the power-supply board (the hottest corner of the enclosure). Cooling air is drawn through the sides of the cabinet, and through the front under the disk drives—which helps cool the motherboard circuitry of the Mac, still mounted flat on the bottom of the cabinet.

In normal use, this fan is *loud*. From an engineering standpoint, it's likely that the fan was fitted to suit the requirements of the internal hard-disk option. For the plain-vanilla SE fitted with two floppy drives, it's a bit much. Apple is aware of a swelling tide of customer complaints, and is . . . well, looking into the problem.

The power supply—a topic of widespread controversy on previous Macintosh computers—has been completely re-designed. Power output is up to a full 100 watts, which should be enough to power the optional internal hard-disk, a fistful of RAM-upgrade chips, and who-knows-what else.

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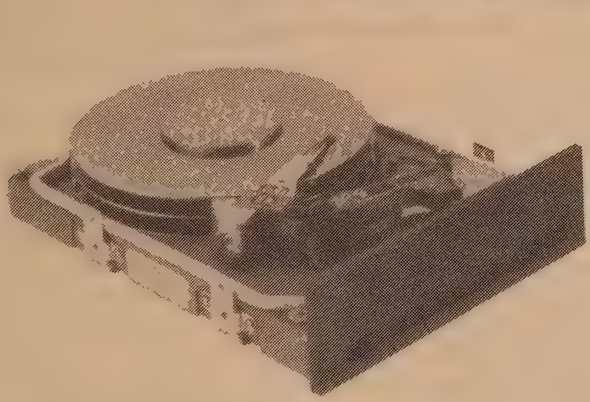

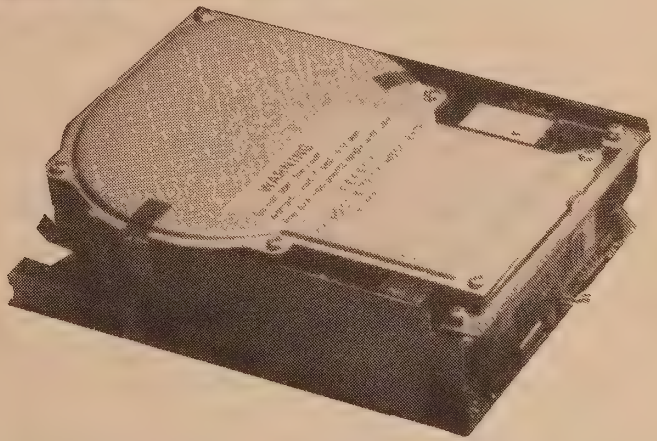

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power supply is compatibility with various voltages. The Macintosh SE will automatically adjust to either 110v or 220v AC power sources, without the need for external voltage convertors. Want to take your SE overseas on business? Just bring along the cables required to plug it into the wall.

The new power supply feeds a revamped motherboard: the "thinking" component of the Macintosh SE. The most significant—and the most hidden—feature of the SE is a 96-pin bus connector located along the side of the motherboard. While it's not a true slot, like the NuBus connector of the Macintosh II, it provides a straight-through, unbuffered connection to the 68000 microprocessor that is the heart of all current Macintosh computers.

This bus connector paves the way to a variety of performance upgrades, already being announced by third-party developers. Want a 68020 processor, with a 16MHz clock speed, and a 68881 co-processor like the Macintosh II? No problem. Just plug it in. The Macintosh SE is equipped to support a wide range of hardware packages for this bus connector. MS-DOS emulators, big-screen adapters, and other products are already in the final stages of development to take advantage of it.

Also on the new motherboard are enlarged, 256K ROM (read-only memory) chips—double the size of the 128K ROMs installed on the Macintosh Plus. At this point, about 170K of the 256K capacity is actually used in the new ROMs, with the bulk of the changes going to support the color QuickDraw routines employed on the Macintosh II. Of course, with its 9" black-and-white display, color isn't a primary concern for the Macintosh SE. What is a concern is how these new ROMs will interact with future software—with software written for the Macintosh II. This is no small consideration: at this point, you can bank on the fact that every new software package will be written with the Macintosh II, and the new ROMs, in mind.

The keyboard is another big change for the Macintosh SE. The keyboard is now sold separately from the Macintosh, and is currently offered in two styles: the 81-key "Apple Keyboard," and an enlarged 105-key "Extended Keyboard."

The move to make the keyboard a separate item was made for several reasons. Obviously, it gives customers the choice of the keyboard which best suits their needs. It also opens the door for third-party manufacturers to offer variations on Apple's keyboards, perhaps with options and capabilities to suit specialized business software.

A not-so-obvious aspect of offering the keyboard separately is the potential it suggests for the SE to use software that won't use a keyboard at all. For example, future music software may be designed to interface music synthesizers directly into the Macintosh SE's "desktop bus" port, or may involve circuit boards for the SE's expansion slot—wiring synthesizers and other musical instruments directly to the computer. Other keyboard-less applications might apply the Macintosh SE as an analytical instrument: a tool for calibrating and tracking laboratory experiments, or for maintaining quality control on a production line. Such applications could easily allow all data-input to be directly channeled to the motherboard for processing, with the screen display, or hard-copy print-out automatically monitoring the results.

The Macintosh SE represents a departure point: an entirely new generation of Macintosh computers.

THE SE IN REAL LIFE

The unit we reviewed was the standard Macintosh SE, fitted with two internal 800K floppy-disk drives, and the standard 81-key Apple Keyboard.

The Apple Keyboard is about the same size and shape as the keyboard supplied with the Macintosh Plus, but features a slightly different key layout. The 10-key numeric keypad is still to the right side of the keyboard, and its keys are unchanged from the Macintosh Plus. For the main section of the keyboard, the "arrow" keys (used to move the screen cursor) are now along the bottom row of the keyboard, and the caps-lock key has been relocated to the bottom-left corner of the keyboard. The keyboard also sports three new keys: Control, Escape, and Reset. When tried with a variety of Macintosh software, these three keys seemed to have no effect; at this time, they simply aren't recognized by existing software.

To make room for all this key shuffling, the space-bar has been made narrower, and the size of the Option key has been reduced to the diminutive size of the other alphakeys. While the narrower space-bar didn't prove to be any problem for touch-typists, the Option key is another matter. Its new, small size, and its placement — awkwardly down under the left pinky—make it difficult to reach. Many Macintosh applications make use of Option-key shortcut combinations, and the Option key is used to create special mathematical and typographic characters from the keyboard. In short, the new Option key will slow down a touch-typist. It's not a matter of "getting used to it"; the new key layout is simply inferior to the keyboard of the Macintosh Plus.

To add insult to injury, the Apple Keyboard isn't 100% compatible with existing Macintosh software. In technical terms, the "keyboard mapping" of the new Apple Keyboard differs from the keyboard of the Macintosh Plus. For example, with Microsoft *Word* version 3.0, the command-shift-4 keystroke, used to select the next word in a document, not only doesn't work in the Macintosh SE, but will actually "crash" the program—forcing a re-start of the computer, and the loss of all unsaved data. Since the new Apple Keyboard, and the larger Extended Keyboard, will form the mainstay of future Macintosh computers, software such as *Word* 3.0 will evolve to accommodate these differences. As of right now, compatibility with existing Macintosh software is a hit-and-miss proposition.

The Macintosh SE is undeniably faster than a Macintosh Plus. On the motherboard, a single VLSI "gate-array" chip has replaced a battery of 16 chips employed to serve the same function on the Mac Plus. Allegedly, this new VLSI chip runs cooler and consumes less power than the complement of chips on the Macintosh Plus—which should enhance the reliability of the SE.

The way the SE addresses (thinks about) the screen is also slightly different: since the screen is a dynamic element for data-entry on the Macintosh, past incarnations of the Mac have scanned the screen for data-entry on a one-to-one basis (one processing cycle of the 68000 CPU, one scan of screen data, one scan of the CPU, etc.). For the SE, this ratio has been changed to three-to-one (the CPU given three consecutive cycles, the screen data one, the CPU another three, etc.). The net result? The Macintosh SE has more time to devote to calculations, and is therefore about 10% to 20% faster than a Plus, depending on the application.

Though it uses the same pin configuration, and is compatible with SCSI devices engineered for the Macintosh Plus, the SCSI port on the Macintosh SE has been completely revised. When the Macintosh Plus was introduced a little over a year ago, there were virtually no SCSI hard-drives available for the machine. To minimize possible incompatibilities, Apple deliberately made the SCSI port slower than it might have been, in hopes that a slightly slower data exchange (with more comprehensive error-checking, or "handshaking" routines) would lead to greater reliability from SCSI devices. As the market has matured, Apple has determined that there's no undue concern for SCSI error-checking, and has pulled out the stops to let the SCSI port for the Macintosh SE run at top speed.

It should be pointed out that some SCSI hard-drive manufacturers have violated Apple's guidelines in a quest for higher performance, and employ hardware or software "patches" to make their hard-drive run faster on a Macintosh Plus. Since the Macintosh SE and the Macintosh II will employ the new SCSI port, such unorthodox patches might not work with the new machines. If you're thinking of upgrading your computer, and want to use your existing SCSI hard-disk drive, it would be wise to try the drive with the Macintosh SE before making a commitment to purchase one.

THE BOTTOM LINE

To put the Macintosh SE into perspective, this machine offers (for the most part) compatibility with the existing body of Macintosh software. As of today, there are a few peculiarities for various applications, but, as time goes by, significant software packages will be revised to accommodate the Macintosh SE—to accommodate the differences of the ROMs and the differences of the new Apple Keyboard.

The Macintosh SE offers a compact, expandable package. Even with the entry-level dual 800K-drive version, the SE represents a stand-alone, portable workstation. Throw the whole thing in a bag, add a box of floppy disks, and you have a ready-to-go productivity center that can be toted into a classroom or used for on-site research at a public library. The expansion bus on the motherboard invites accessory cards to translate IBM-generated MS-DOS data, making it an ideal keystone for a complex office network system. The improved power supply, with its (noisy and damnable) cooling fan, should enable the Macintosh SE to stand up to the rigors of the most demanding, round-the-clock on-line operation.

Will the Macintosh SE replace the Macintosh Plus? Should the average user rush out and upgrade to the latest incarnation of the "computer for the rest of us?" Probably not. The Plus and the SE are targeted at different markets. Apple envisions that the Macintosh SE will become a mainstream business tool: an adaptable, convertible, powerful and portable instrument to complement white-collar desktops throughout the country. The Plus? Ideally suited for environments where the features built into the Macintosh answer the needs of the particular application. And then, there's this Macintosh II . . . ☐

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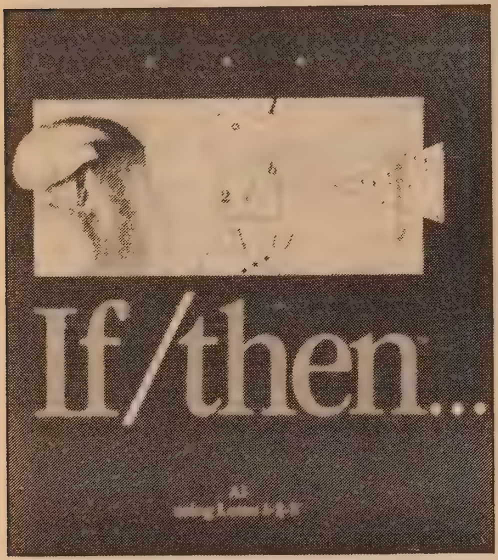

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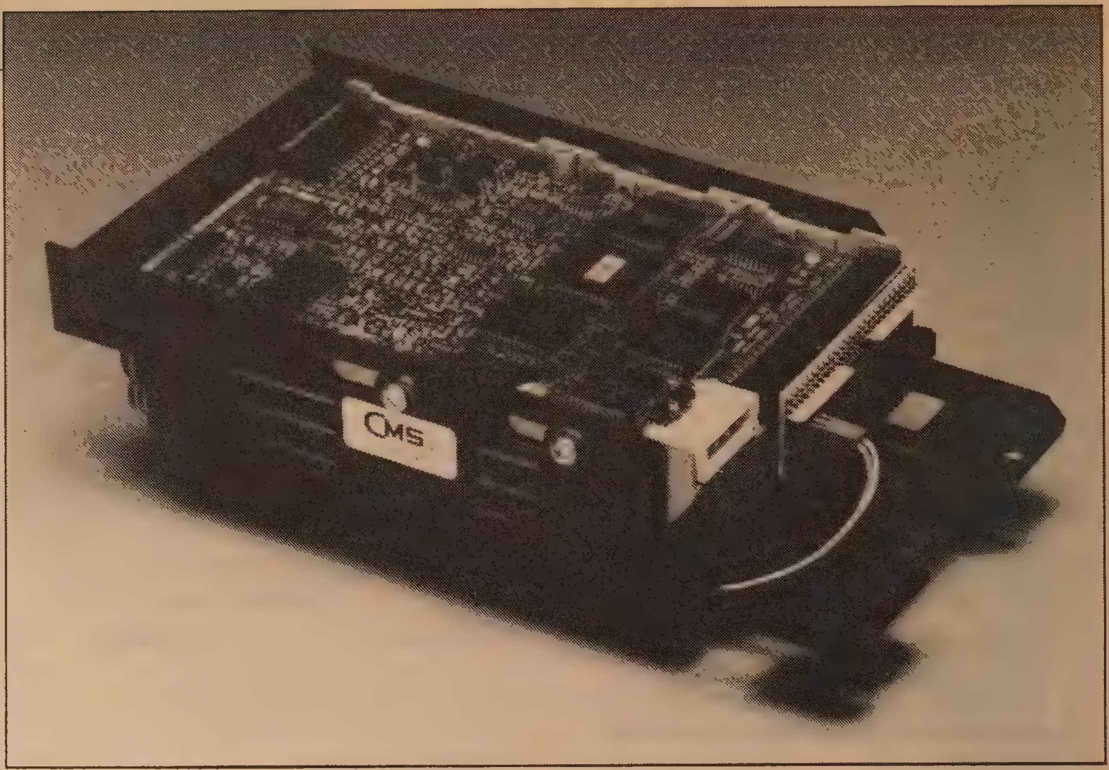

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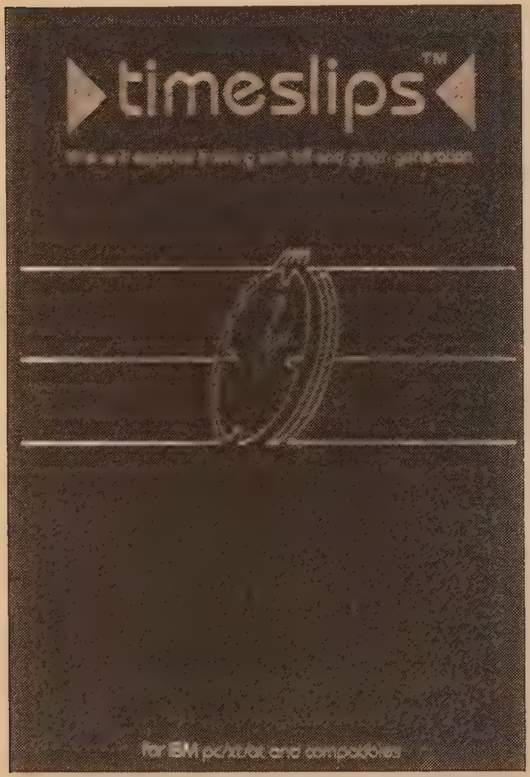

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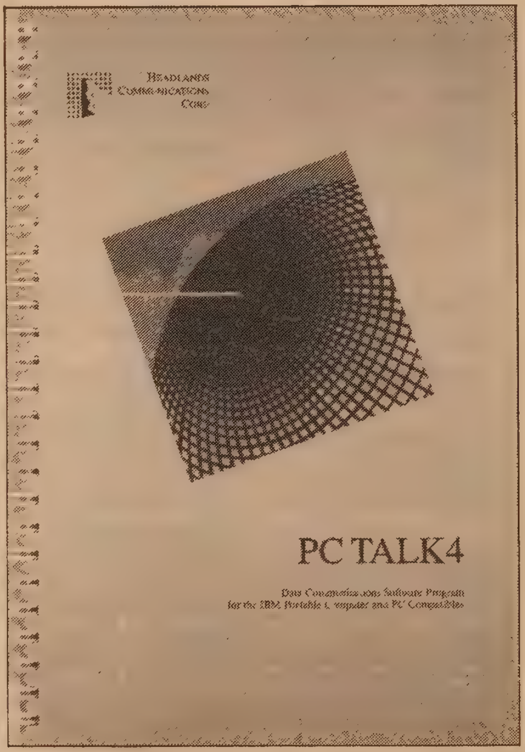
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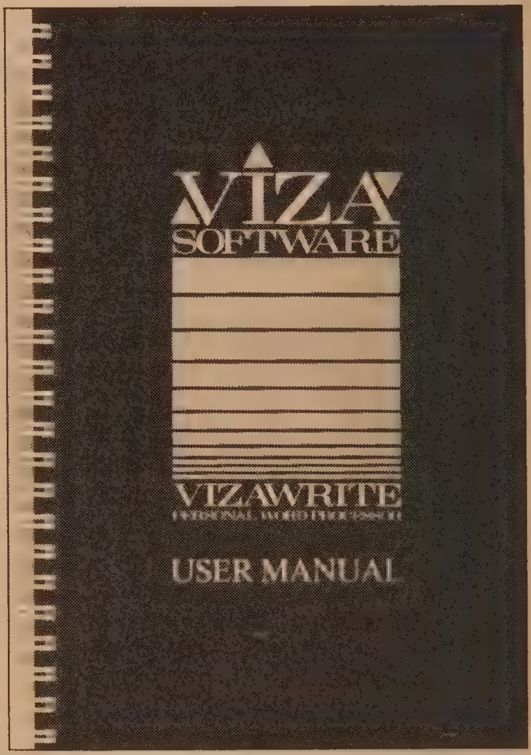

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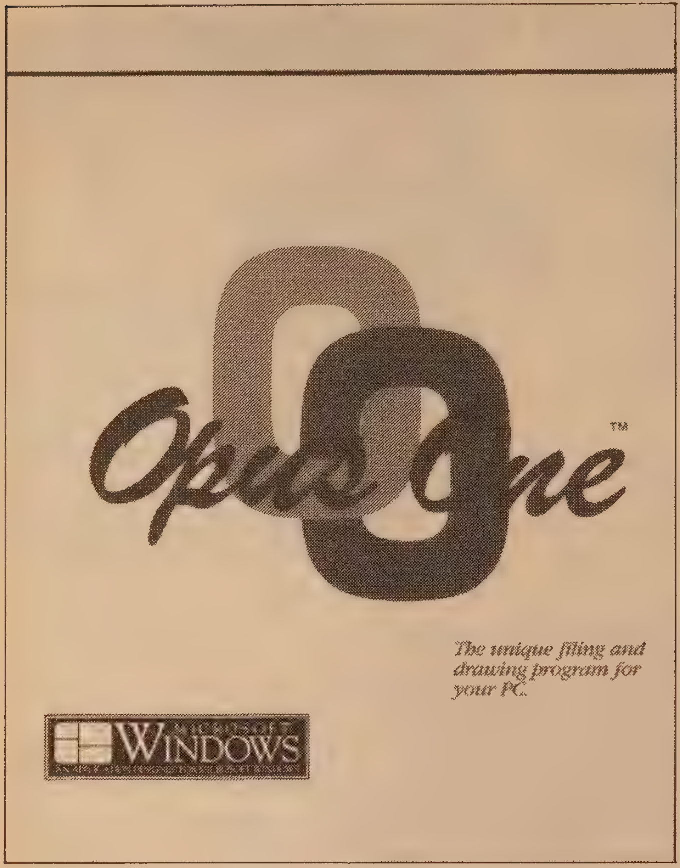
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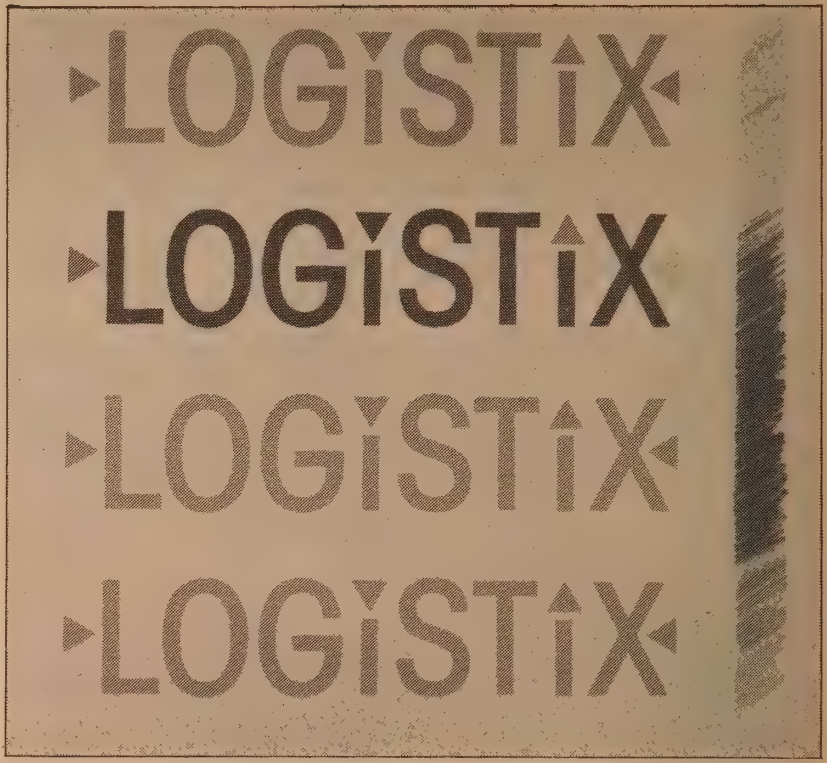
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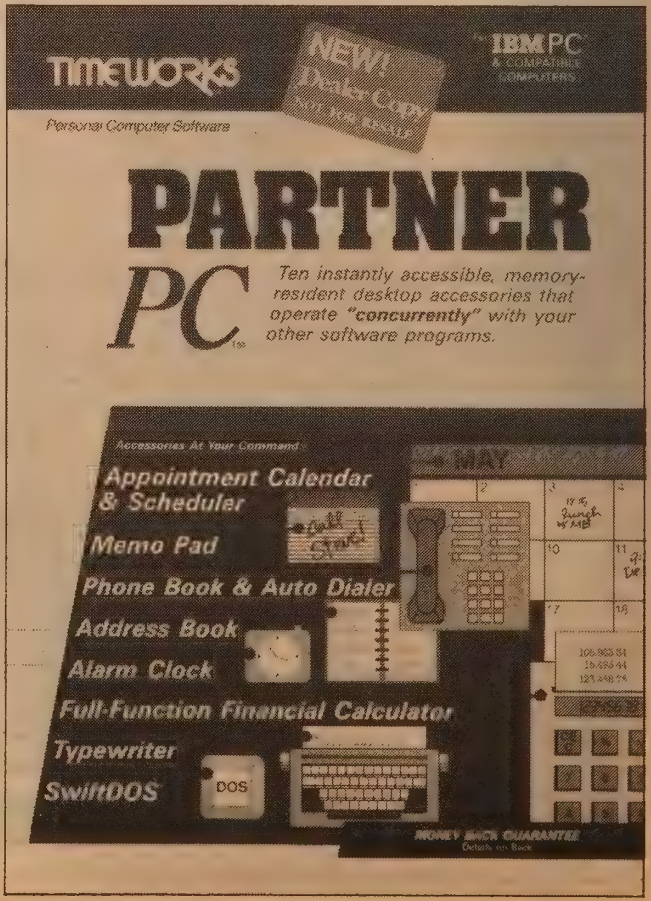
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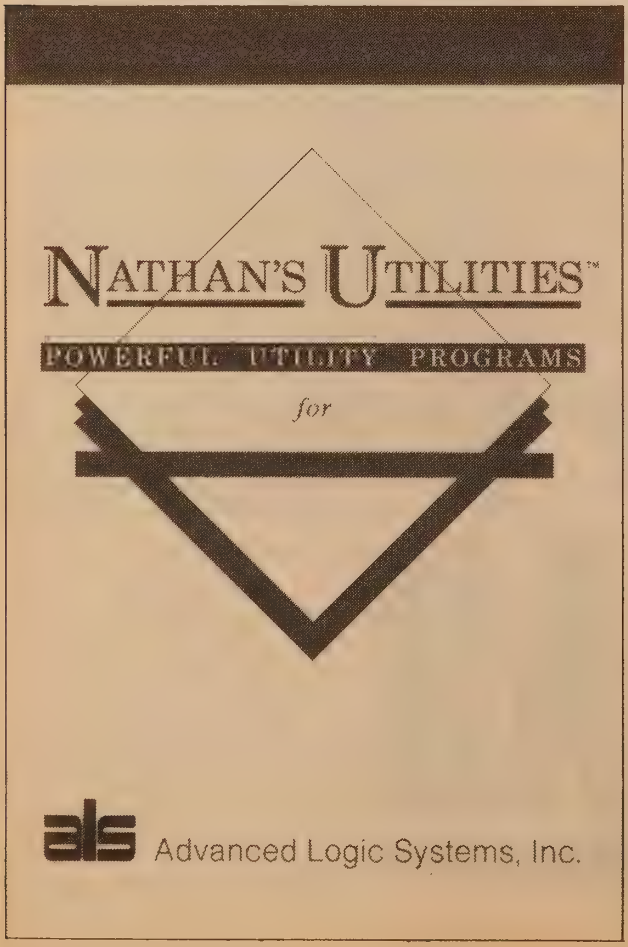
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DATA BASE MANAGEMENT

The Report Report

By Warren Sirota

The *dBASE III+* CREATE REPORT command gives you a fairly easy way of extracting and printing out the valuable information stored in your databases. However, CREATE REPORT is neither particularly powerful nor flexible. It is limited to two levels of subtotaling and one report line per record. You cannot affect the basic report format; it's strictly "take it or leave it." As soon as your reports exceed the limits of the *dBASE* reporting facilities—and that may be the day after you start to use *dBASE*—you are forced into an ugly round of trivia, writing routines to keep track of when to insert page breaks into the already convoluted logic of your report. After a while, you evolve stock routines that take care of line counting and the like, but report generation never becomes convenient or pleasant. That is, unless you get help.

RELATIONAL REPORT WRITER

dBASE reporting help is at hand in a well-conceived and executed product called *Relational Report Writer* (*RR* for short), published by Concentric Data Systems, Inc. This *dBASE* companion product provides powerful and flexible reporting capabilities at the bargain price of $99, and may save you hours of work. Although there are certain types of reports which will still require hand-coding, this product can be useful in a wide variety of settings.

RR is a stand-alone program that can create reports out of *dBASE III* files. You work with it interactively, through a series of Lotus-style menus, to design the report. It helps you along at every stage of the game, letting you design complex reports by "pointing and clicking," or as close as you can come to that without a mouse. You can preview or print the report at any stage of the game, with two keystrokes from the master menu.

What about programmability? Concentric provides run-time modules which you can copy freely and distribute with your application. The RRUNTIME program, as it is called, is executed from within your program by issuing the command:

```
RUN RRUNTIME <options>
```

In fact, you aren't limited to calling RRUNTIME from *dBASE*. You can issue the RRUNTIME command from the DOS prompt, from a batch file, or from any other program that allows you to execute DOS commands. If you do issue the command from *dBASE*, you must have 190K of memory available beyond what *dBASE* needs. Similarly, if you're using *Clipper* you will need 190K of memory beyond that which is used by your program.

> **Relational Report Writer is a stand-alone program that can create reports out of dBASE III files. You work with it interactively, through a series of Lotus-style menus, to design the report.**

The **options** to the RRUNTIME command consist primarily of a filename for what Concentric calls a **jobfile.** This allows you to tell RRUNTIME to produce a number of reports in a row, and can specify overrides for such things as the range of records to be used in the report, the output destination, and a few other relevant factors.

FIRST TEST

I tested *RR* on several reports. The first was a particularly tough report that I had written in *Clipper* for a client. The client was keeping track of a large number of slides, which were sometimes collected into presentations. I grouped this data into three tables:

- SLIDES, which held the slide ID number, the slide title, some text describing the slide (as a memo field) and other attributes.

- PRESENT1, which held presentation ID numbers, the presentation title and owner, and other attributes of presentations as a whole.

- PRESENT2, which holds the ordered list of slides for each presentation.

The idea of the report was to produce a script for each presentation. The script would consist of the presentation title, followed by an ordered list of slides in the presentation. Listed for each slide would be its ID, its title, and the text describing the slide.

From a *dBASE* standpoint, there are two problems with this report. The first is that PRESENT2 contains the key fields as pointers into both SLIDES and PRESENT1. Ideally, the file PRESENT2 would be related to both of the other files; unfortunately, *dBASE* does not allow a file to be related to more than one other file at a time. *Clipper* allows more than one such relation, so this wasn't a problem in my situation. *RR* also allows multiple relations. When you define a relation to *RR*, you also tell the program what to do if a lookup fails. In many cases, you will want to simply skip the record and go on to the next one, but in some cases the failure of a lookup will mean that something is wrong with the database. You have the option of telling *RR* which of these courses to take for every relation in the report.

So, *RR* handled the tricky relational aspect of this report neatly. I'm pleased to say that it also did quite well with the other tricky aspect, memo fields. Memo fields are very difficult to handle from within a programmed report, since *dBASE* gives you no way of knowing how long they are. The only practical means of formatting a complex report that contains memo fields from *dBASE* is to write the report to a file and then to read the file into a database consisting of 80-byte records using APPEND SDF. Cumbersome, to say the least. However, *RR* handled the memo fields almost without a snag.

There was only one thing that I tried to do with this report that I couldn't. When it encounters an empty memo field, *RR* doesn't print the field and doesn't print a blank line. This works out nicely. However, I wanted to offset my non-empty memos by surrounding them with a blank line on either side. I couldn't do it—I could get blank lines around my memo, but then they would also be there if the memo was empty, leaving blank lines between slide titles where I didn't want them. This is a fairly minor quibble, however.

SECOND TEST

RR didn't do so well, unfortunately, on my second test. This involved trying to recreate my billing report with *RR*. The stumbling block there was the inclusion of several different sets of detail lines within the same report—separate groupings for hours billed, flat fees, and amounts received. *RR* reports all have one set of detail lines, which may be separated into several groups, rather than detail lines coming from several different database files. I could have joined the detail lines into a single file and, with a little juggling, managed to "trick" *RR* into doing my report, but that seemed like too much trouble.

SUMMARY

Relational Report Writer is a capable and flexible report generator which can be used by your programs or interactively by analysts. Communication of parameters to the runtime module and reports is somewhat awkward, but serviceable. Many standard and complex reports are handled well by this product, but it is still possible to come up with reports that are beyond its capabilities or that require pre-conditioning or restructuring of the data before sending it to the report writer. All in all, a good value. ☐

Copyright ©1987 by Warren Sirota. All rights reserved. Warren Sirota is a database consultant with experience in a wide range of languages. He also composes and programs computer music. He lives in Oakland and can be reached at (415) 482-3979.

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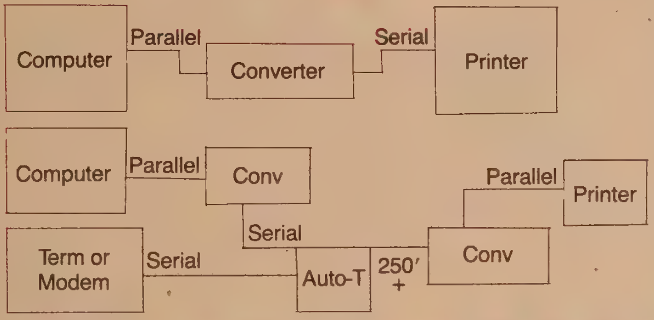

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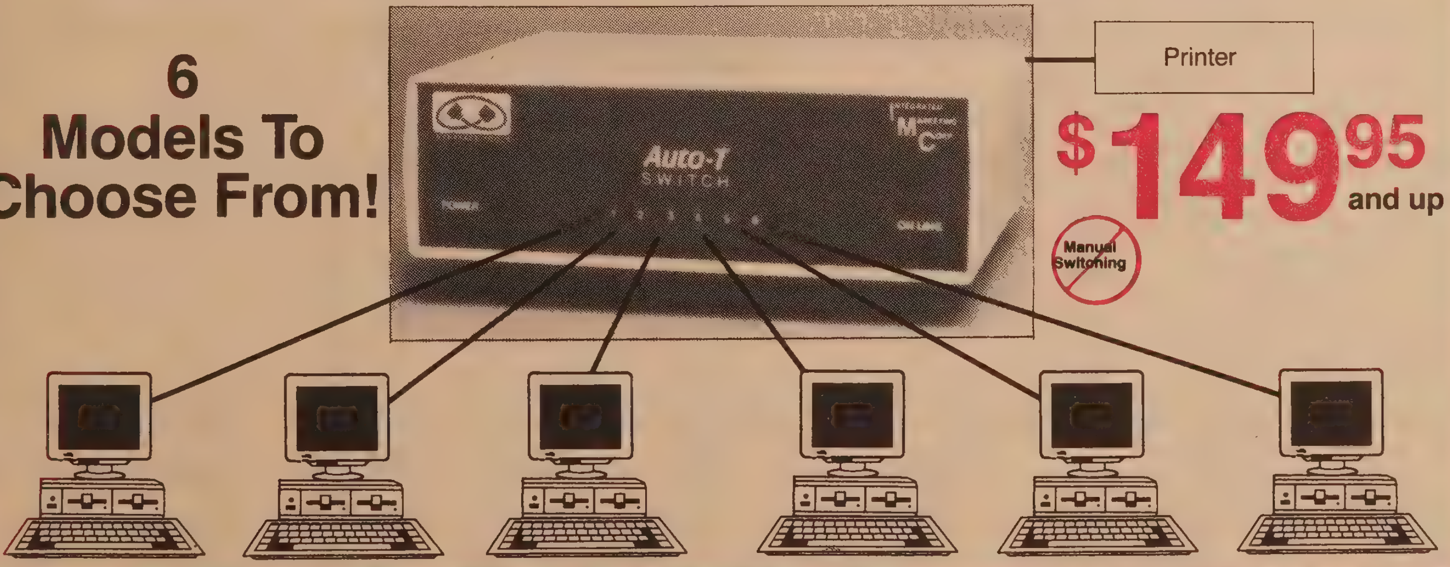

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PC SYSTEMS

IBM's Second Generation PCs: What It All Means

By Ken Milburn

Although this column usually covers the ways of putting things together in order to get a specific job done, we can't get anything done effectively unless we plan ahead in configuring our base hardware. So it seems appropriate here to take a look at what IBM has announced and what it all means in terms of your being able to plan for the immediate future.

If you've been holding your breath for the past few months, waiting for the tablets to come down the Blue Mountain—you can breathe now. IBM has proven itself more strategically intelligent than it often gets credit for, especially from those who predicted a closed, proprietary system. The software you're using now will run on the new systems, and neither of the new operating systems will shut these applications out, either. None of the IBM-machines is a clone-killer, even though they may prove tough competitors. At the same time, IBM is filling its bread-and-butter corporate client's wish list, effectively slowing the inroads clones and Macs are making in that area.

IBM's strategy seems to have been to provide irresistible features and functions that competitors would have a hard time copying—without entirely shutting out the competition or abandoning the installed base of PCs.

THE NEW MACHINES

There was significant news in five categories: Personal System/2 computers, operating systems, a new bus architecture, peripherals and software.

Eight new computers were introduced, divided into four new "Personal Systems": Models 30, 50, 60 and 80. All of these machines are entirely robot-made at IBM's Austin, Texas plant, where they can be spit out at the rate of one per minute (and probably very cheaply, leaving IBM lots of margin to be competitive). Up to 80 percent (depending on model) of a PS/2's content was developed by IBM. And hard-to-copy IBM-unique logic chips are used to support the generic Intel 8086, 80286 and 80386 processors used in the PS/2 series.

Nevertheless, there's nothing to suggest that Big Blue is ready to cut the umbilical cord between PS/2 systems and the PC and compatible 8088/86/286/386 machines. The new technology does make the systems smaller, theoretically more reliable, faster and less power-hungry.

> **Many functions that used to require adapter cards are included on the new system, so you can get by with fewer slots, and systems are less costly and confusing to configure. PS/2 systems are easier to set up because there are no dip switches or jumpers.**

The earth-shaking news is that the fragile and clumsy 5¼" floppy is about to turn up its toes. All the new machines use 3.5" plastic-encased floppies, joining Apple, Amiga and Atari.

Many functions that used to require adapter cards are included on the new system, so you can get by with fewer slots, and systems are less costly and confusing to configure. PS/2 systems are also easier to set up because there are no "dip" switches or jumpers. Motherboards are even smarter than the AT's.

The Micro Channel, included on the higher-end machines, offers a two-fold benefit: it's been designed to speed the transfer of data and instructions around the system and it's designed to minimize conflicts between simultaneously running programs.

Expanded memory is supported in some versions of the new operating systems. If you're running an AT-type machine, you'll need an EMS card with 16-bit bus to take advantages of all the new OS features. Eight-bit cards like the Thesys Fast Card may not do, even though they're cheaper and run just fine in present ATs.

The Model 30 is a foxily diminutive desktop unit based on the Intel 8 MHz 8086. It comes with either two 720K 3.5" floppies or with one floppy and a 20MB hard disk. The system board also contains 640K RAM memory and enhanced graphics support (640×480 dots in two colors, or 320×200 dots in 256 colors) called Multi-Color Graphics Array (MGA), plus ports for mouse, modem, printer and keyboard. Also included at no extra cost are clock/calendar and the new style "enhanced" keyboard (the one with separate cursor keys and function keys at the top).

At $1,695 the Model 30 is a bigger bargain than it seems—considering that color graphics, 384K of memory, and the extra ports would cost between $500 and $600 to add to the PC/XT it replaces. This is the only PS/2 model that can use PC-compatible expansion cards.

The bad news is that there are only three slots and a dinky 70 watt power supply. Still, the potential system throughput of the Model 30 is up to 2.5 times faster than that of the IBM Personal Computer XT.

The Model 30 is obviously designed to ease the transition between PC and PS/2 generations. It is aimed at entrepeneurships, individuals, home and student users.

The other computers in the Personal System/2 series are based on more powerful 80286 (16 bit) and 80386 processors, use a new system bus (Micro Channel Architecture) and expansion card connector, have cache memory for faster disk access, and come with the new Video Graphics Array that supports 640×480×16-color and 320×200×256-color graphics and 720×400×16-color text modes. They all use 3.5" floppies that store 1.4MB of data, but can also read the lower density 3.5" format of the Model 30 and PC-Convertible. They also include all the Model 30's above-noted standard features.

The Model 50 looks like a puffed-up Model 30 and is the only desktop among the Micro Channel machines. Like the Model 30, it has a teeny power supply (94W), only three card slots, and is available now.

However, the Model 50 is a much faster machine. The processor is a 10MHz 80286, the (included) 20MB hard disk uses a SCSI-like controller, and standard RAM is 1 MB (expandable to 7 MB on board). IBM claims that these features, combined with MCA and the disk-cache, make it "up to twice as fast as the IBM/AT." The base Model 50 sells for $3,595.

The Model 50 is meant to be the "serious" business machine for personal use. It's fast and powerful enough for use in professional desktop design, publishing and engineering workstation environments. Styled for prestige, it will find its way onto numerous executive desks.

The remaining five "Personal System/2" machines are less personal, in that they are all designed to be connected to each other or to other PC-workalikes in a Local Area Network or to IBM's larger systems. All are designed as free-standing "towers," meant to sit under or alongside a desk. All have seven 16-bit expansion slots and 200+ watt power supplies. They are really meant to run multitasking Operating System/2 or multi-user UNIX, and to be connected up to other systems.

The two versions of the Model 60 (44 or 70MB hard-disks) are 16-bit 80286 10MHz machines. Memory can be expanded to 15MB—one short of the 16MB limit of the 286. Strange.

The configuration featuring the 44MB fixed disk drive is available immediately for $5,295—nearly twice the price of a comparably equipped 10MHz AT clone. IBM seems to be calculating performance characteristics against the 6MHz AT, so we estimate the real performance difference between the Model 60 and a 10MHz AT with disk caching software to be no more than 20%.

The three versions of the Model 80 are based on the super-powerful 32-bit 80386. Two of the

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Copyright © 1987 by Ken Milburn. All rights reserved. Ken Milburn is a freelance writer on Microcomputers. His articles have appeared in numerous computer publications, including PCWorld, InfoWorld, Computer Graphics World *and* MicroTimes. *He also does system configuration for small businesses. He can be reached at (415) 331-6926 or by sending E-mail to (ken) on* The WELL, *(415) 332-6106.*

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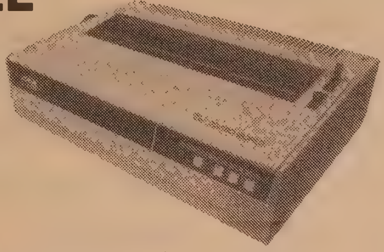

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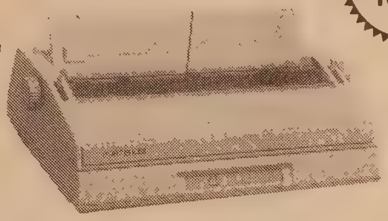

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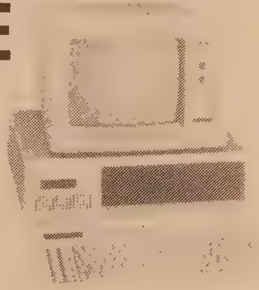

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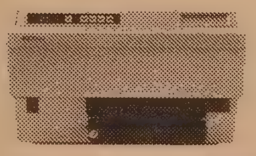

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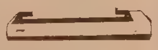

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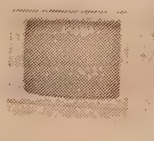

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models run at the standard 16MHz clock rate, while the $11,000 top-of-the-line model (not available until 1988) zips along at 20MHz. Depending on model, these machines come standard with 1MB or 2MB of memory.

Of the seven expansion slots, three are 32-bit and four are 16-bit. Two models will be available in July, one with 1MB of RAM and a 40MB drive, the other with 2MB RAM and 70 MB drive. The third model will be available in the fall; it sports a 20MHz processor and uses 1M-bit memory chips.

NEW MONITORS

As you've no doubt guessed, all of these machines require new monitors, but they (and versions of the new display cards) can be retrofitted to PCs and PC-workalikes. It's also important to note that the new displays and graphics adapters are fully compatible with graphics modes for the current IBM Color Graphics Adapter (CGA) and Enhanced Graphics Adapter (EGA). That means that virtually all current software will run on the new displays without modification. All the displays feature a non-glare screen and have an integrated or optional tilt and swivel base.

The new monochrome monitor uses white phosphor and can be switched from black-on-white to white-on-black; colors will be shown in 64 shades of gray. Color monitors come in 12", 14" and 16" models, none of which is multi-synchronous. The first two can show 640×480 dots (or less). On the 16" color monitor, up to 1,024 by 768 dots are addressable.

All but the 16" display are available now at prices ranging from $250 for the mono to $1,550 for the 16-incher (plus another $1,290 for the adapter card to drive it). VGA retrofit display adapters are $595—about the same list as the current crop of EEGA third-party cards. It'll be tough to get a discount for a while, though. And there won't be much immediate software support for VGA. The difference is, you can't get anything like 256 color on the EEGAs at any price.

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Speaking of retrofitting, you can also get a 720KB 3.5" internal floppy drive from IBM for a fairly reasonable $170. These will work just as well in clones, so there's no barrier to communicating data from the old machines to the new machines. Or, if you have the two sitting side by side, IBM will sell you software (IBM Data Migration Facility) that'll let you transfer files directly from any PS/2 machine to any PC/MS-DOS machine through a standard printer cable.

OPERATING SYSTEMS

Before The Announcement, there was much speculation that IBM would introduce a proprietary operating system. When the day came, two were announced. One is an upgrade to PC-DOS, the other an entirely new multi-tasking OS that breaks the 640K memory-barrier. Neither is incompatible with present PC/MS-DOS applications. Both operating systems were developed jointly with Microsoft and will be available for the full range of PS/2, PC and PC-compatible machines.

Available immediately, IBM PC-DOS 3.3 supports all of the new systems and all previous models of the IBM Personal Computer; it's now on dealer's shelves. Operating System/2, available in the first quarter of 1988, will run on Personal System/2 Models 50, 60 and 80 (as well as AT and 386 lookalikes), and is compatible with most applications written for PC-DOS. You can upgrade to DOS 3.3 for $75. New commands (FASTOPEN, CALL and APPEND) have been added to make files within DOS faster and easier to use. Other enhancements include additional communications ports and support of fixed disks larger than 32 MB.

Not available until "sometime in 1988," Operating System/2 is still vaporware. At least we now know that its not going to be called "A-DOS or DOS 5.0." In the meantime, there's no reason not to use already available solutions to multi-tasking and over 640K memory management, such as Digital Research's Concurrent DOS 386, QuarterDeck's *DesqView* or SoftLogic's VM386.

The announcement also confirms some other significant hunches. The new system is designed to use a version of Microsoft *Windows* as a graphical and multi-tasking user interface. The Presentation Manager (new *Windows*) is also designed to encourage application developers to use conventional commands for common functions, such as HELP, QUIT, and CANCEL, thereby reducing user confusion. A new version of *Windows* for PC/MS-DOS will be available in June to match the Presentation Manager's enhanced features, such as overlapping windows. This gives IBM a jump-start on making its PCs more Mac-like by providing a consistent, interactive and graphical (non text-mode) interface. Wise move, since computers have to become more intuitive if they are going to reach the 80% of office desks that don't have them yet.

OS/2 is the first application of IBM Systems Application Architecture, a common framework for developing and using the same application programs across the range of IBM personal, System/3X and System/370 computers.

OS/2 will become available in stages, beginning in the first quarter of 1988. OS/2, Standard Edition 1.0, supports large memory, multitasking, and a PC/MS-DOS operating environment. It will be generally available in the first quarter of 1988. The second version, 1.1, which will replace Version 1.0, adds the Presentation Manager. Additional functional detail and availability of Standard Edition 1.1 will be announced in the fourth quarter of this year.

IBM will also offer a proprietary "Extended Edition" (probably the foundation for all the proprietary OS rumors), which adds an advanced relational database management system, intersystem communications, connectivity, and terminal emulation.

It was these add-ons that caused the stock of Ashton-Tate and Microstuf (the leading vendors of database and communications software, respectively) to drop the day before The Announcement. Microsoft and Lotus stocks shot up at the same time, thanks to the endorsement of *Windows*. Lotus has said that it's working on *Windows*-based *1-2-3* and other applications.

IMPLICATIONS

To me, the most worrisome part of The Announcement was the Micro Channel architecture. IBM is using a great many home-designed and -built chips in its implementation, and the circuit design itself is no doubt heavily protected. So despite the fact that all current applications are compatible with the new systems, it is entirely within reason that new applications could be developed that will only run on the PS/2 and other IBM-proprietary machines. Whether or not the public would accept such applications remains to be seen. So far, sales of IBM-published software for micros have been the pits.

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The most significant peripheral is an optical disk that contains 200MB of storage. You can add new information to this disk, but can't erase or overwrite it. Because data are unerasable and the media removable, WORM drives make ideal backup devices and ideal repositories for large on-line databases. At nearly three grand, this drive isn't irresistible, but the Blue endorsement will encourage competition and, in combination with Microsoft's CD-ROM offering, encourage competition in laser storage technology.

The WORM (Write Once, Read Many) drive is scheduled for availability in the fall, in either internal or external configurations. Different configurations allow it to be used with the full range of PS/2 and PC-compatible machines.

Considerably less exciting is IBM's new laser printer and publishing system. The laser printer, including the slot-based intelligence to run PostScript, cost about $2,000 more than an Apple LaserWriter and prints about 30% slower. On the other hand, the idea of keeping the intelligence and the printer separate makes it easier to upgrade one or the other as new developments come along. And IBM's endorsement helps to legitimize *Windows*, *PageMaker*, PostScript and PC-based desktop publishing in general. ☐

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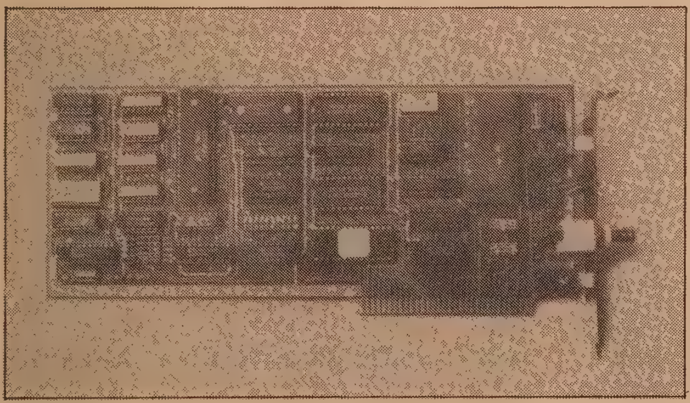

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From The Mailbox

By Matthew Leeds

Once again it's time to take a look through the stack of new products that have arrived lately. There has been a tremendous number of new games, a few applications, and a couple of odds and ends that don't fit anywhere.

Accolade has an interesting new game out being billed as the first interactive comic book. Called *Accolade's Comics*, it spans three disks for the C64. It combines comic book graphics and animation with eight arcade-style games. There are two main themes, and dozens of sub-plots that depend on your choices during play. Think of it as a text adventure that uses the comic book format, with arcade-style games thrown in at various points.

> To play Epyx's Sub Battle Simulator on the C64, you'll need to learn quite a bit about the operation of a submarine–this is a very technical simulation and requires a fair amount of dedication.

Also from Accolade comes *Power*, an arcade style 22nd century wargame sold under the Avantage label, Accolade's mid-priced line.

Epyx has released *Sub Battle Simulator* for the C64. This is the first release in a new series of simulations and adventure games called the Master's Collection. You are the commander of a WWII sub, whose goal is to complete one of 60 missions in either the Atlantic or Pacific, and return to home base. You will be commanding one of six different classes of U.S. or German subs between the years of 1939–45. The year will have a direct effect on what equipment is on the sub. To play you will need to learn quite a bit about the operation of a submarine — in fact this is a very technical simulation, and requires a fair amount of dedication to learning to achieve any success in gameplay. Appendices, a glossary, and the quick reference card come in very handy during play.

Also from Epyx is the third release in the Graphics Scrapbook series, *Chapter III: School*. It contains over 100 graphic images compatible with *Print Shop* and *Print Master*. Part of the marketing promotion Epyx is using will include a "buy one, get one free" offer, good until the end of June on any Graphics Scrapbook package.

Electronic Arts has completed its repackaging of the *Ultima* series with the release of *Ultima I* for the C64. This new version has improved graphics and animation, and faster gameplay.

Also for the C64 is *World Tour Golf*, EA's entry into the world of clubs and clubhouses. Players can choose from twelve courses worldwide, or design their own. The course design module offers complete control over placement of hills, bunkers, trees, water hazards, distance to greens, slopes, and background skyline. You can also design your own player, or take on the attributes of a favorite pro. Split screen graphics provide a view of the golfer's perspective and a bird's eye view simultaneously.

S.O.G.W.A.P. Software has released an upgrade to *The Big Blue Reader* for the 128. This new version offers support for Commodore 128 CP/M, as well as the current version's support for MS-DOS. *The Big Blue Reader* is a file transfer utility that will move ASCII files from one disk format to another. Binary files may also be transferred. BBR does not, however, add MS-DOS program execution capability to the 128. The new version also prints files, uses the burst mode of the 1571 to speed loading of files, supports the 1700 and 1750 RAM packs to increase file buffer sizes, and has enhanced conversion options.

Activision has a whole host of new products for the Amiga. Heading up the list is a new version of *The Music Studio*. This enhanced version includes support for IFF files (two way conversion). Song files created with *Instant Music* can be moved into *Music Studio* for editing and enhancement, and *Music Studio* compositions can be converted for use in *Deluxe Video*.

Under Activision's Gamestar label are three new releases. *GFL Championship Football*, a graphical simulation that uses elaborate playbooks and scrolling screen animation to give players a sense of being there. The digitized sounds of play may be the best part of this game. *Championship Baseball* is a similar product, using a 3-D split-screen perspective to give you an enhanced sense of the game. You have control over every element of the game, almost to the point of tedium. *Championship Golf: The Great Courses Of The World — Volume One: Pebble Beach*, includes all eighteen holes of this world famous course. This is a full simulation of the golfing experience, including a caddy should you require one.

Also from Activision is a new type of software, billed as interactive fiction. The program is called *Portal*, a science fiction tale set in 2106. You return from space to find Earth devoid of people. A single operating computer terminal is your sole source to information. You locate Homer, a biological computer, and the sole survivor of the world that was once your home. Together you attempt to discover what has happened and why.

Electronic Arts has signed Sierra OnLine as an affiliated label, and has released five products for the Amiga. *Winnie The Pooh In The Hundred Acre Wood* is an adventure game designed for children ages seven and up. It promotes reading comprehension, problem solving, logic and mapping skills, while entertaining. *King's Quest I, II,* and *III* are animated 3-D fantasy adventure sets requiring strategy, skill, and patience. *Space Quest* is a parody of futuristic adventure games. You start as a sanitation engineer from the planet Xenon. Eventually you save the entire galaxy from space pirates. Just another day at the dump.

Finally, another interesting program from Pete Goodeve (author of *Xicon*). *Sili (Con:)* is a smart input line interpreter for the Amiga. *Sili (Con:)* opens a window on your CLI window that lets you keep a command history, edit commands prior to execution, recall commands and re-edit them. Commands can be deleted from the history list and new commands can be added without executing them. You no longer need to use the Execute command to call batch files because *Sili (Con:)* automatically checks commands to see if they are batch files. It either executes the commands or runs them with the Execute command. *Sili (Con:)* is shareware, with a suggested donation of $25.00. This will get you an update and support. The program is available from user groups and distributors of freely-copyable software (Fish disks, HotMix disks, etc.), and some local Amiga retailers. ☐

> Activision's new Music Studio for the Amiga includes support for IFF files with two-way conversion; Instant Music files can be moved into Music Studio for editing and enhancements, and Music Studio compositions can be converted for use in Deluxe Video.

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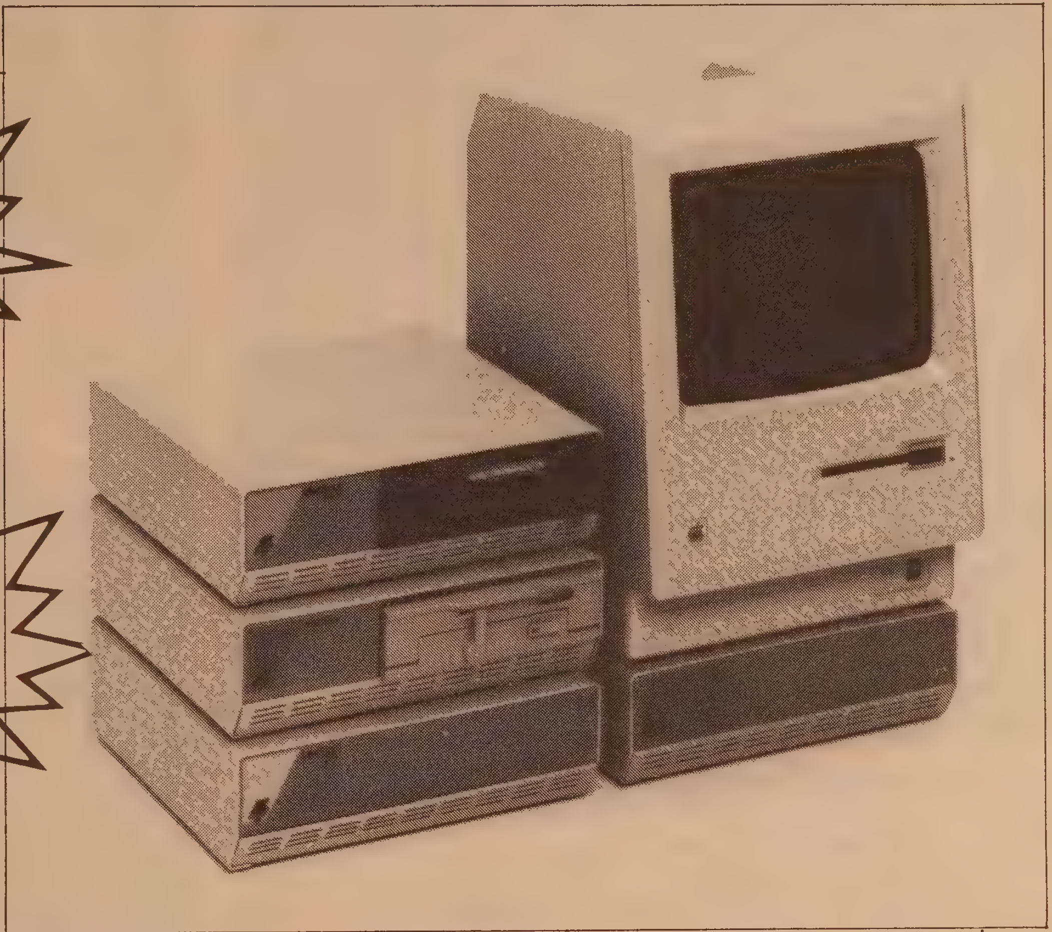

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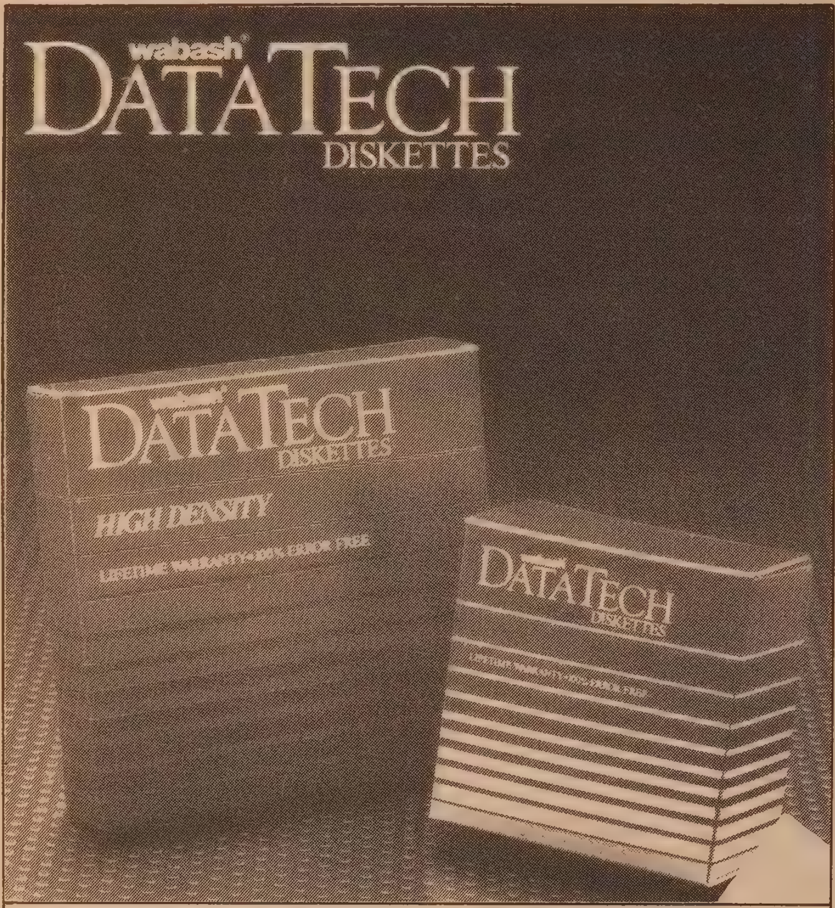
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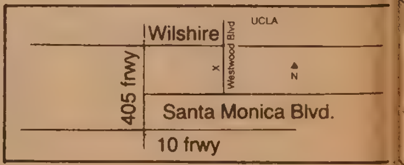
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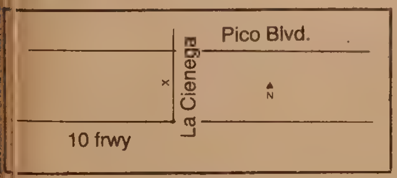

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ATARI ST

Publishing Partner: Desktop Publishing On The ST

By Helmi Kobler

Way back in January of 1985, Apple announced its LaserWriter, that pricey, high-tech printer pretty much responsible for making desktop publishing possible. The Atari 520 ST was still a half year away from release then, and had just started shipping in June when a small Seattle-based company called Aldus introduced its *PageMaker* software for the Mac. *PageMaker* became an overnight sensation, and the Mac found itself pioneering an entirely new and revolutionary application for personal computers: desktop publishing.

Atari ST users, however, were still playing with an unfinished version of *NEOchrome* and a rather limited *First Word* that couldn't even double-space a document. Nonetheless, it didn't take the ST community long to realize that whatever the Mac could do, the ST had the potential to do better—especially in the area of desktop publishing. How? The ST was faster than the Mac. It had a higher screen resolution, too. And it was about half the price of a comparable 512K un-enhanced Mac system. The only hitch was that there was no publishing software to exploit this superior hardware.

Now, though, some serious desktop publishing packages are appearing and it's beginning to look like the ST may become a competent alternative to the expensive Mac and MS-DOS publishing systems used today.

The ST's first publishing package was Soft Logik's (314/894-8608) *Publishing Partner*, which has more or less become the desktop publishing software of choice (in fact, it's been the *only* choice until recently). Resembling Aldus's *PageMaker*, the $149.95 program lets you create detailed page layouts of text and graphics (with monochrome or color ST sytems), which can then be printed on either a dot matrix or PostScript laser printer. It's like an electronic paste-up board, where you can plop objects such as text columns or pictures down on a page and easily arrange them to your liking. Since *Partner* uses the WYSIWYG (or What-You-See-Is-What-You-Get, if you don't like to toss around those fancy acronyms) approach to page design, your printed page will look exactly like the one you conjured on-screen.

Creating page layouts with *Partner* is relatively easy until you get into some unusually complex designs. Text columns can be defined either manually with the mouse or by way of the Create Columns option, where you indicate the number of columns you want and the gutter space between them, and *Partner* creates them for you. Once a column has been defined, text can be entered through the keyboard or, more likely, by "importing" an ASCII file written with, say, *Word Writer ST*. Though Soft Logik says *Partner* handles word processing tasks well, I found that it's fine for typing headlines or captions, but less desirable for anything larger than that. Better to leave body copy to a dedicated word processor.

Publishing Partner can do some fantastic tricks that no dedicated word processor has managed yet, though. For instance, text can be cast in a variety of typefaces, point sizes and special attributes. If you're using a PostScript printer, you can print in Helvetica and Times fonts of any point size from 2 to 216, though 72 points is the largest size your monitor will display. If you're using a dot matrix printer, you'll limited to only Helvetica and two System fonts. *Partner* requires a screen and printer version of each laser and dot matrix font, which apparently entails a painstaking creation process. So the initial selection is pretty limited, though additional fonts are available from Soft Logik at $29.95 for a set of three. *Publishing Partner* also sports 15 special text attributes. Besides your everyday bold, italics and underline effects, you can spice up your type with attributes such as Backslant, Shadow, Mirror, Upside Down and more. All fonts, point sizes and attributes can be mixed within the same column.

And, of course, *Partner* has definable character spacing, line spacing and kerning by points. It will also center, justify, and block text right or left, and route overflowed text on individual pages or through an entire document.

On the graphics side of things, *Partner* can import pictures in either Degas, NEOchrome or Tiny format, though you get the best results (and sometimes the only acceptable results) with high resolution Degas files. Importing is done by loading a graphic into the program's picture buffer and boxing the portion you'd like to display in your page. Once you've got a graphic on the page, it can be easily moved, resized or cropped.

More important, though, is that *Publishing Partner* is not only built to support the fancy PostScript laser printers most other desktop publishing programs are limited to, but also works well with the cheap $250 dot matrix machines that you and I own. Soft Logik has created drivers for just about every 9- and 24-pin printer you can name. They have also invested a lot of effort into making dot matrix output look as professional as possible. And does it! In some cases, you'd have to take a second look at a *Publishing Partner* page done on a good matrix printer to realize it's not 300 dot-per-inch laser quality.

And for those who need laser printer output, *Publishing Partner* performs fine when connected to, say, an Apple LaserWriter. And if you don't own a PostScript printer yourself, *Partner* can save your documents as PostScript files which can then be uploaded to systems that do have the proper equipment. Since *Partner* supports PostScript, you can print your documents on everything from a 300 dpi LaserWriter to a 2570 dpi Linotronic image setter.

Publishing Partner is not perfect, though. Still in its first revision, it has developed a few annoying bugs. For instance, if you play around too much with different fonts of different sizes, you may be pleasantly surprised by a system crash. It doesn't happen often, but it happens. Occasionally, a single pixel might appear on your page and refuse to be deleted. Not so bad, you think, until it's discovered that that single pixel will prevent the entire page from printing! You're sure to stumble upon other little quirks.

I'd also like to see some new features added to *Partner* as soon as possible. Automatic hyphenation using an algorithm and exceptions dictionary would be very useful. As would the ability to retain some style and format information from imported *First Word* text files. And text flow around regular and irregularly-shaped graphics would give users a great deal of flexibility in designing layouts. Finally, the ability to group text and graphics objects together would save a lot of time when moving large portions of a page.

Soft Logik plans to have a new version of *Publishing Partner* out by summer's end. I hope we can expect to see a few of these suggestions implemented in the new release. If Soft Logik wants its program to be state of the art, it's going to have to make these changes. The Mac and MS-DOS world are already enjoying the second and third generation of desktop publishing software. For the ST to compete with those systems, it's got to have strong software to build on.

But I have confidence in Soft Logik. It's working hard to make *Partner* as useful as possible. For example, it recently licensed a good number of PostScript fonts from a Mac developer called Century Software. It's also working with a small company called The Font Factory to distribute dot matrix *Partner* fonts and clip art disks. And perhaps the most exciting news is that Soft Logik will soon be selling a $99.99 scanner that works much like ThunderScan for the Macintosh. It's actually a fiber optic cable that attaches to the print carriage on a dot matrix printer. What you get is an extremely affordable 72 dpi scanner. Look for it in June, says Soft Logik.

So the ST is beginning to live up to its desktop publishing promise. *Publishing Partner* is the first sign of this, but certainly not the last. Spectrum HoloByte, for instance, has released a publishing package from England called *Fleet Street Publisher*. And you can expect to see more font- and clip art-related products popping up pretty soon. The ST still has a long way to go before it catches up with the Mac and MS-DOS publishing systems available. But it's definitely on its way.

And just a quick closing note. Atari is putting on an Atari Expo-type event this June 18 and 19 at the Santa Clara Convention Center. Fifty to 100 exhibitors are expected to be there, along with seminars, grand displays and give-aways. Tickets are $5 at the door for each day. You can call Atari at (408) 745-2000 for more info. See you there! ☐

Helmi Kobler took his first step into the computer world in 1983 when he walked out of Macy's with an Atari 800 in his arms. Still an Atari user, he's now inseparably attached to his ST. He can be reached through MicroTimes *or e-mail <helmi> on* The WELL *at (415) 332-6106.*

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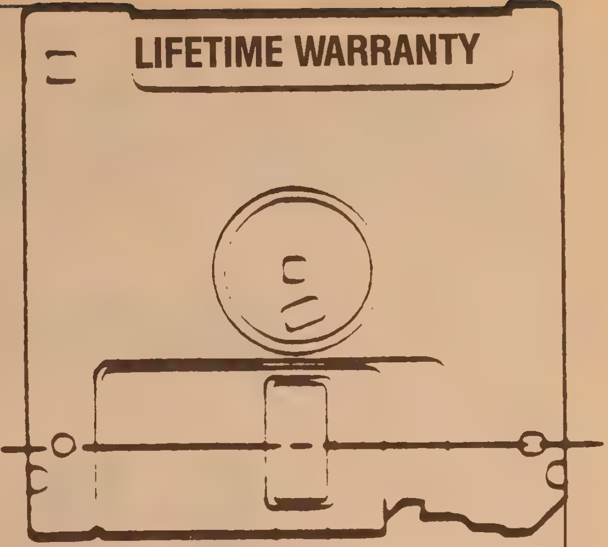

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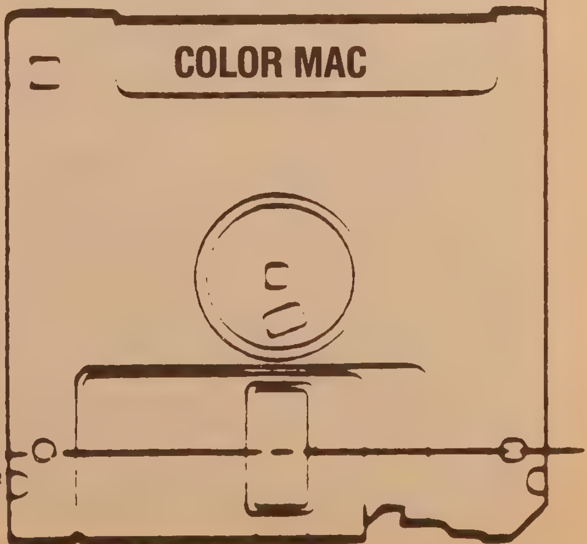

E-Mail Economics

By Brock N. Meeks

The year was 1959 and the US Post Office was poised to deliver a service straight out of a Flash Gordon episode. That year, US Postmaster General Arthur E. Summerfield confidently announced: "Before man reaches the moon, your mail will be delivered from New York to California, to India, or to Australia by guided missiles. We stand on the threshold of rocket mail."

> **Picking the right E-mail service for your needs is no less confusing than choosing an alternate long-distance service. You have to compare rates, incentive services (such as volume discounts), customer support, and more.**

Obviously, something went awry on the way to the launching pad.

Though Summerfield missed the mark on his predictions, he was right about two things: mail service of the future would be fast, and it would use high technology. Both of those features are embodied in today's electronic mail (E-mail) services. However, E-mail services have proliferated to the point where it's hard to sort out which service is the best buy.

The variety of E-mail services you can choose from brings to mind the state of the telephone industry, and picking the right E-mail service for your needs is no less confusing than choosing an alternate long-distance service. You have to compare rates, incentive services (such as volume discounts), customer support, and more.

When comparing E-mail services, you have to look closely at rate structure—not all systems are created equal. This column examines the bottom line of four popular E-mail services: CompuServe's EasyPlex, MCI Mail, Western Union's EasyLink, and RCA Mail.

EASYPLEX

CompuServe's E-mail system is called EasyPlex. Charges for using EasyPlex are the same as when using any part of the CompuServe database. Rates are broken down into Peak (prime time) and non-peak (non-prime time) hours. For this comparison, tests were made during off-peak hours (6 pm to 7 am). Basic rates for EasyPlex are $6.00 an hour for 300-bps transmission, $12.50 an hour for 1200-bps transmission. (CompuServe also has rates for 2400-bps and 9600-bps, but for comparison purposes, only 300/1200-bps transmissions were used.) CompuServe also tacks on a $0.25 per hour connect charge to each of the above mentioned rates, bringing the total to $6.25 per hour for 300-bps and $12.75 per hour for 1200-bps access.

MCI MAIL

MCI Mail is unique among these four services because it doesn't charge for connect time. MCI Mail gives its users free access phone lines in 50 major cities. If you happen to live in a city that doesn't have one of these local access phone lines, you can access the service through an 800 number or via the Tymnet packet-switched network. MCI Mail does charge a connect fee you if you use one of these two options. The 800 number costs $0.15 per minute; Tymnet costs $0.05 per minute. (For this article a local phone line was used so connect rates were not a factor.) MCI Mail charges you by the "MCI ounce," which is 7,500 characters. Each "ounce" costs you a flat rate of $1. So a message of 15,000 characters will cost you $2. You should note that if your message is only one character over 7,500 you are charged for the full "ounce."

EASYLINK

Western Union's EasyLink charges $0.35 a minute for 300-bps service and $0.50 a minute for 1200-bps. (From midnight to 7 am these rates are cut by 40%. The discount rate is not used for this article's comparison.) Like MCI Mail, EasyLink is accessible via local phone lines. If your city doesn't have a local number you can use a nationwide 800 number; however, the 800 number tacks on an additional $0.30 a minute to your bill.

RCA MAIL

RCA Mail is a relative newcomer, but is rapidly gaining acceptance among E-mail users. RCA charges different rates for peak and off-peak hours. The business rate (7 am to 6 pm) is the most expensive at $14 per hour; off-peak rate (6 pm to 9 pm weekdays and 7 am to 9 pm weekends and holidays) is $7 per hour; night rate (9 pm to 7 am daily) is $4 per hour. These rates apply for both 300-bps and 1200-bps transmissions. These rates are for local access. If you can't get to a local telephone number an 800 number is available. Charges for using this 800 number, however, add substantially to the rates listed above. For this comparison, the off-peak rates were used. In addition, RCA charges an extra $.05 per unit. (Each unit equals 1,000 characters transmitted).

ONLINE BENCHMARKS

The following comparisons use three text benchmarks: a one-page business letter (about 2K in length), a four-page letter (10,000 characters), and a nine-page report (22,500 characters).

> **MCI Mail and EasyPlex have an interconnection capability, which allows EasyPlex subscribers to send E-mail to MCI Mail users and vice-versa.**

The one-page business letter equaled 2,500 characters. This is how the rates stacked for uploading the one-page business letter:

MCI Mail (300/1200-bps) $1
EasyLink (1:54 @ 300-bps): $0.66
EasyLink (0:24 @ 1200-bps): $0.20
EasyPlex (1:54 @ 300-bps): $0.19
EasyPlex (0:41 @ 1200-bps): $0.14
RCA Mail (1:54 @ 300-bps, including a two unit charge): $0.32
RCA Mail (0:41 @ 1200-bps, including a two unit charge): $0.18

The next test was using a four-page letter—about 10,000 characters. Costs for uploading this text were as follows:

MCI Mail (300/1200-bps): $2
EasyLink (6:04 @ 300-bps): $2.11
EasyLink (1:38 @ 1200-bps): $0.81
EasyPlex (6:40 @ 300-bps): $0.68

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Brock Meeks is a San Diego-based freelance writer and columnist. He collects subscriptions to E-mail services. He currently has ten.

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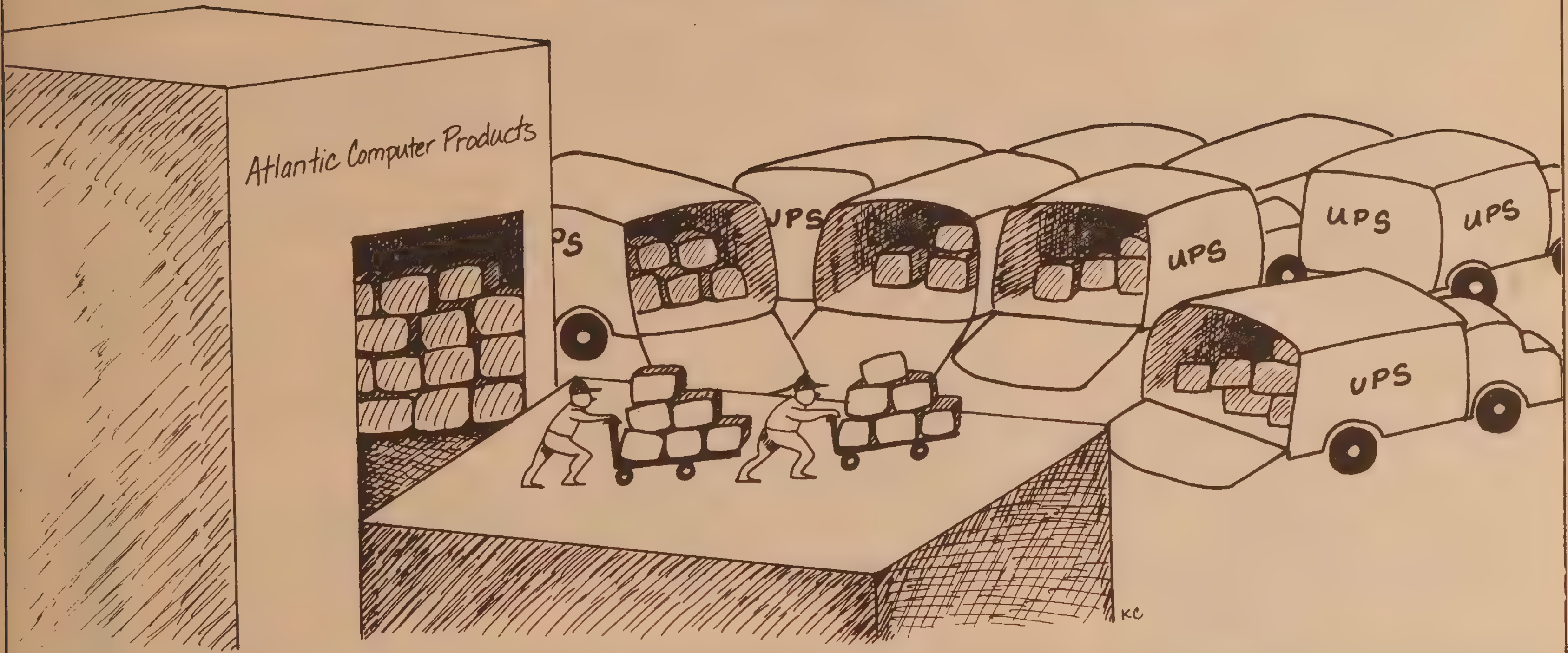

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EasyPlex (1:55 @ 1200-bps): $0.40
RCA Mail (6:04 @ 300-bps, including a 10 unit charge): $1.19
RCA Mail (1:38 @ 1200-bps, including a 10 unit charge): $0.69

The last test consisted of sending a nine-page report—about 22,500 characters. Costs for uploading the report came to:

MCI Mail (300/1200-bps): $3
EasyLink (13:44 @ 300-bps): $4.78
EasyLink (3:27 @ 1200-bps): $1.72
EasyPlex (13:55 @ 300-bps): $1.42
EasyPlex (3:35 @ 1200-bps): $0.75
RCA Mail (13:44 @ 300-bps, including a 22 unit charge): $2.67
RCA Mail (3:27 @ 1200-bps, including a 22 unit charge): $1.49

> **The choice would seem clear-cut: choose the system with the lowest costs. If only it were that easy. There are some other factors to consider–online overhead, additional services, etc.**

OTHER CONSIDERATIONS

The choice would seem clear-cut: choose the system with the lowest costs. If only it were that easy. There are some other factors to consider.

Using a service such as CompuServe, for example, you have to "navigate" your way into the EasyPlex area. As you make your way into the E-mail section the meter is running. So even though it takes you only 41 seconds to upload your one-page business letter, it may have taken you a full two minutes to actually get set up to send that letter. Those two minutes fatten the actual cost of uploading that letter to $0.57. That extra $0.42 is your "online overhead." This online overhead applies to any system that charges you by the minute.

In addition to the online overhead, you must remember that each of the above examples was prepared offline, and then uploaded. Had I composed a one-page letter online it could easily have cost me several dollars. The important exception here is MCI Mail. Because MCI Mail doesn't charge for online time, you can compose your letters online without running up your tab. In this sense, MCI Mail has no "online overhead."

Although price is a prime factor for choosing an E-mail service, there are several other considerations. Each of the services mentioned here, for example, gives you access (at additional online charges) to news and information databases; the quality of the databases, however, varies. Each system also gives you telex capability. However, of the four E-mail services, only MCI Mail and EasyPlex have an interconnection capability. This interconnection allows EasyPlex subscribers to send E-mail to MCI Mail users and vice-versa.

All these statistics and comparisons really can't decide which system is best for your particular application. The best thing to do is use the figures here as a guide and then write the E-mail companies that interest you. Ask them to send you an information package. Compare features and talk with users of different systems; your final decision will be a combination of all these factors.

Resources

CompuServe EasyPlex
5000 Arlington Centre Blvd.
P.O. Box 20212
Columbus, OH 43220
(800) 848-8990 (outside Ohio)
(614) 457-8650 (Ohio residents)

EasyLink
Western Union Telegraph
9229 LBJ Freeway
Suite 234
Dallas, TX 75243
(800) 527-5184

MCI Mail
2000 M. St. NW
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- 150 Watt Power Supply
- Color Graphics Card
- AT Emulator Keyboard
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- Japanese Disk Drive
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Multifunction (AT) + 2 MB Cap.	165
I/O Card (clock/cal/ser/par/game ports)	67
Case	39
150W Power Supply	65
Color graphics card w/printer port	65
576K Card	40
Joystick Card	25

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8087 (8 Mhz)	149
80287 (6 MHz)	159

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TEACHING PROGRAMS

Learning DOS

Published by: *Microsoft*
List Price: *$49.95*
Reviewed by: *Wayne A. Yacco*

We always knew that it was easy to learn DOS, we just didn't know how to go about it. Finally Microsoft itself has provided the ultimate solution. The gnomes who labor in the bowels of Redmond have taken the interface from the renowned training program for Microsoft *Word* (release 3.10 is the latest incarnation) and developed an application to teach DOS. *Learning DOS* uses the same, rather excellent, training program to introduce the user to all of the subtle nuances of the DOS operating system.

This program, like its predecessors, the keyboard and mouse versions of *Learning Microsoft Word*, uses the concept of programmed instruction to repeatedly test and retrain a user in the areas that have not been retained after initial training. It is possible to suspend the program and return, later, to proceed from that very point. The program is designed to store the restart checkpoint for several users, allowing many individuals to interlace their training schedules.

Included, with the four diskettes provided, and two versions of the tutorial, one each for floppy- and hard-disk based systems. There is also one diskette each for a *DOS Quick Reference* and a *DOS Sampler* of Microsoft business software. The latter is essentially a commercial for a little-known software vendor from the state of Washington.

Learning DOS is composed of "How to Use This Course," "What You Can Accomplish With DOS," "Using DOS," "Practicing What You've Learned," and the "Review Index." The Review Index allows one to return to any portion of the lessons which requires more study. All the other lesson titles are self-explanatory with the further exception of Using DOS, which leads to several deeper levels of menus, eventually providing lessons for individual topics. The topics each address a data-processing operation, not individual commands.

Available nearly any time is the control bar. Its functions, such as Quit, Back, Hint, Index, Menu, Practice, etc., are accessed by holding down the CTRL key and typing the function's first letter. This makes it simple for the user to tailor the material and pace to individual needs. Left on its own, the program inexorably takes the user through every conceivable facet of microcomputer operation.

The only criticism that might be leveled at *Learning DOS* is that its slow pace cannot be speeded up to suit the requirements of fast readers or those familiar with most of the material. This will problaby not be a problem for the beginning user. It is possible to further slow screens because progress waits for the user to occasionally strike the space bar.

The DOS Quick Reference is for users who, once they've grown accustomed to DOS, become impatient with the training program but still need help sometimes (i.e., all of us). Typing HELP enters the first menu screen of basic DOS commands and topics. A second screen lists advanced commands and topics. The menu is primitive, requiring the user to type in the command rather than allowing it to be selected with the cursor, but the reference is effective. Where appropriate, a command's explanation includes cross references to related commands and topics.

While technically accurate, the Quick Reference does not provide much beyond what is available in the manual. The explanation of the /b switch for the copy command should be clear to any mathematician, engineer, or computer scientist, but may still baffle a typical business user. It would have been simple to give an instance of when and how it might be used.

Any new user will find this an invaluable aid and a constant companion at the computer. At about the price of an hour's technical support, it is a genuine bargain.

BOOKS

Command Performance: Microsoft Excel

Written By: *Douglas Hergert*
Published by: *Microsoft Press (1986) 532 pages*
List Price: *$24.95 softcover*
Reviewed by: *Jim Wolcott*

Since its release in September, 1985, Microsoft's *Excel* has established itself as *the* multi-megaton spreadsheet for Apple's Macintosh computer. And since that release, more than a comfortable armload of books have appeared offering hints, tips, how-to's, and shortcuts for making the most of this landmark program.

Of course, with that much power and complexity, even users who spend their workday in front of an *Excel* screen will frequently dive for their reference manuals. The problem is that oft-needed information is usually buried deep within chapters presenting a general topic. In a quick reference situation, it's tough to remember whether that page-formatting command is listed under "Page Setup," "Set Print Area," or somewhere else entirely. True, *Excel* features an excellent on-line "Help" menu, but help menus just don't have enough room to illustrate useful examples.

What's been needed for power-programs like *Excel* is a different kind of manual: a directory of concise reference material, coupled with brief examples for each of the features. Organized in a way that information would fall to hand as easily as opening a book.

Enter Douglas Hergert's *Command Performance: Microsoft Excel*. Hergert has extracted most of the information contained in Microsoft's original software manual, and arranged it alphabetically: an encyclopedia of *Excel*'s features.

Facilitating the "information at a glance" format, each of the entries in the book is identified with an icon—in this case, a dark-red graphic that denotes the entry's category. Entries are identified as being associated with pull-down menu commands (for either general menu-bar commands or chart commands), worksheet functions, macro functions, and special "dictionary entries" which give information on fundamental terms and nomenclature.

Each entry contains five basic units of information: Format, Description, Procedure, Example, and Comments. "Format" (for cell functions) is a representation of how the entry would appear within a cell formula. "Description" offers a brief explanation of the features, requirements and usage of a menu command or function. "Procedure" lists the step-by-step process to execute a particular command. "Example" is just that: an example of how the entry might be used within a spreadsheet. "Comments" includes additional information that relates to the entry, and usually has some suggestions on how to use the item in harmony with other *Excel* features.

The book is also lavishly cross-referenced with a system to locate the "Dictionary" entry about a specific topic, and to locate pages containing additional information about particular features.

It should be pointed out that *Command Performance: Microsoft Excel* is not a beginner's guide to using *Excel*. It's not intended to be. The examples lack the depth and explanations necessary for first-time users to grasp basic spreadsheet concepts. However, this book serves as an excellent springboard for PC users already familiar with spreadsheet topography, who are just becoming acquainted with Excel's horsepower. For those already familiar with Microsoft's definitive spreadsheet, database and charting software, *Command Performance: Microsoft Excel* is an indispensable reference tool for making the most of seldom-used features. (Microsoft Press, 16011 N.E. 36th, Redmond, Washington 90873.)

WORD PROCESSORS

For Comment

Designed by: *Mark U. Edwards, James A. Levine and D. Midian Kurland*
Published by: *Brøderbund (1986)*
For: *IBM PC and compatibles (256K, DOS 2.0 or higher, most popular word processors, networks, and printers are supported, color monitor desirable, not copy-protected)*
List price: *$195*
Reviewed by: *Mike Markowitz*

The term "paperless office" is one of those blatant self-contradictions, like "jumbo shrimp," "popular culture," or "compassionate editor." One of the things that has always made the idea of the paperless office illusory is the necessity to circulate paper copies of documents up and down the chain of command to gather vetos, legal opinions, approvals, and other sorts of comments.

For Comment is a new utility program from Brøderbund that creates a software environment for office politics. It is the word-processor equivalent of 3M Post-It notes (those sticky yellow things invented to make a writer's dismal existence yet more miserable) that brings us closer to the day of the paperless office.

Using *For Comment*, an author can circulate copies of a document to as many as fifteen reviewers. The copies may be on disk, or just files on a network. Each reviewer may comment, suggest revisions, or write his own little essay into an individual Notepad. There is an elaborate system of security levels and passwords, so that high-status drones can say rude things about the work of low-status drones without fear of reprisal (unless, perhaps, the low-status drones are skilled at disassembling code).

The basic screen display consists of two windows: an upper window for text and a lower window for comments. The relative size of the windows is easily adjusted. A two-line menu bar follows the familiar style of *Lotus 1-2-3*: selections can be made by simply pressing the first letter of the option's name or by using the arrow keys to highlight a desired option. The program can also be customized according to your hardware configuration, screen color preference and keyboard habits.

A Utility Disk contains a vast collection of printer drivers and some sample files. The lack of copy-protection makes it easy to install *For Comment* on a hard disk and to duplicate the Reviewer

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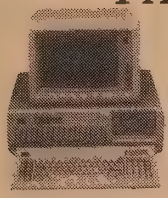

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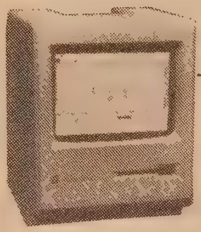

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*Xerox Venture Publisher	$525
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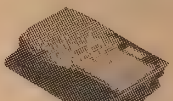

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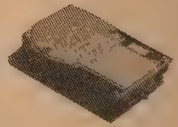

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disk for multiple reviewers (Brøderbund even provides extra disk labels).

The $995 Network version of *For Comment* supports the IBM PC or Token Ring networks, Novell NetWare, or the 3Com EtherSeries. Ethically speaking, one copy of the program must be purchased for each person who will be acting as an Author, but anyone on the network can be a reviewer. In practice, the Authoring part of the program should either be kept off the network entirely, or secured in a private "volume" or directory.

A comment or suggested revision can be up to 64 text lines in length. Reviewers can carry on extended dialogs by commenting on comments. The F1 key calls up a rich array of context-sensitive Help screens.

Although *For Comment* is a complex program, the designers have taken pains to make it easy to learn and use. Along with a fat, spiral-bound User Guide, the package contains a Quick Start leaflet for authors, multiple copies of a Quick Start leaflet for reviewers, and a comprehensive Demo/Tutorial disk. The Tutorial can be completed in about two hours, and uses a humorous example — Abe Lincoln's draft of the Gettysburg Address, circulated to his wife, the Vice President and General Grant.

"Importing" and "exporting" files are two pivotal functions of the program. After booting the Author disk, you designate the file to be imported, and fill out a "cover sheet" listing the reviewers. The program makes its own copy of the document, leaving the original unchanged. Files may be imported in plain ASCII format, or as *WordStar*, *MultiMate* or *WordPerfect* documents with all their formatting intact. After the author has digested all the proposed revisions and comments, he can "export" the file, reading it back into the original word processor format. Any proposed revision may be discarded, or "swapped in" to replace the original text. Reviewers cannot "export" or create a new document, but they have most of the other options and utilities available to authors.

The author can collate multiple sets of comments into a single file, and print out a document in several ways: text with comments printed as footnotes or end notes, text with no comments, comments and revisions only, or the contents of the reviewers' Notepads. The Notepads can hold about two pages of text that is not tied to a particular line of the original document.

The program has excellent error-trapping. I was easily able to recover from every dumb thing I tried, without damage to either my text or my stomach lining. Error Messages are displayed in bold red dialog boxes, and fully explained in an Appendix to the User Guide.

It is difficult to criticize a program that is crafted so carefully and that works so smoothly. Microsoft Word users might be disappointed to find that there is no mouse support in *For Comment*, and that their files must first be converted into ASCII format (with loss of some attributes).

Computer novices may have some difficulty setting up *For Comment* because it requires a CONFIG.SYS file in the root directory with the FILES attribute set to a value of at least 20. I overlooked this instruction when I first tried to use the program, and found that it ran with maddening slowness, stopping to save everything to disk every few keystrokes. When I followed the instructions, the program performed admirably (on a two-floppy AT&T 6300 with nothing special).

I liked this program so well that I brought the first draft of this review (a *MultiMate* document) into *For Comment*, declared myself Reviewer as well as Author, and used it to finish the article. Any errors or omissions are purely the responsibilty of the Reviewer. (Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903-2101.)

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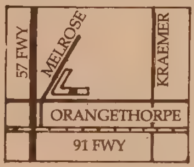

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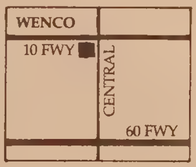

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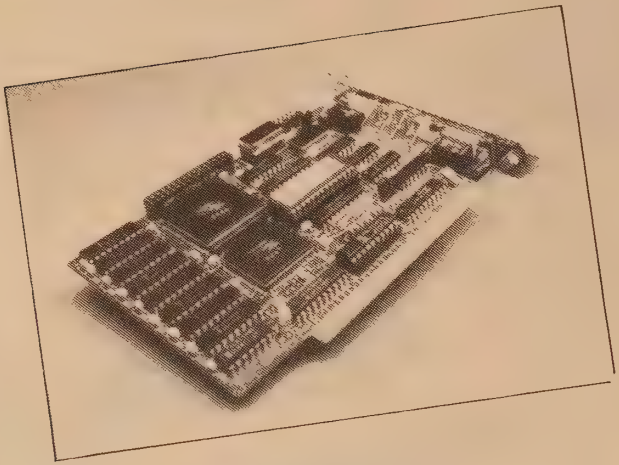

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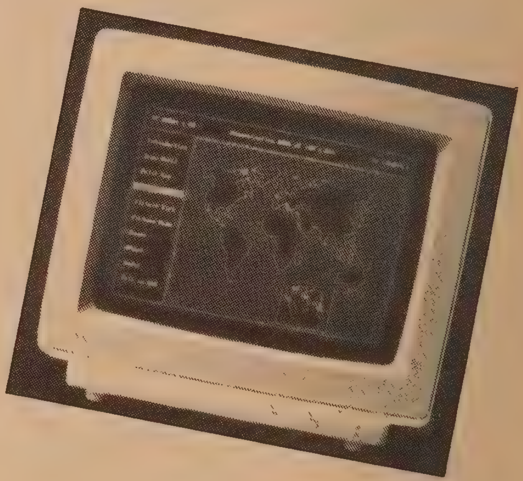

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USER GROUP NETWORK

By Mary Eisenhart

May 13 found me paying a return visit to **East Bay FOG** (First Osborne Group), and a memorable occasion it was. The original plan was that our CP/M ace **Bob Athey** would be along to offer helpful hints and advice to the various Osborne and other CP/M enthusiasts in attendance. Alas, the Exalted Athey was unexpectedly called out of town on biz, so the FOGers got one CP/M-illiterate Macintosh-using editor instead. ("Hey, I once did some data entry on a mailing list that was written in *dBASE II*," I offered hopefully. . .)

The FOGers, however, were both congenial and sympathetic, and the evening proved informative and fascinating—providing a relatively rare opportunity to carry on a conversation with readers and get some much-needed feedback (yes, gentle readers, especially those who so faithfully send in your listings, it may amaze you to know that sometimes *months* go by without a single letter to the editor gracing our mailbox, but so it sometimes is).

At issue was the current and future state of CP/M, the demise of which has been trumpeted from the housetops for some time. FOG itself has evolved beyond its Osborne origins and now supports MS-DOS as well as non-Osborne CP/M machines, a policy which occasioned religious wars some time ago but now seems generally accepted. So being with a roomful of FOGers, I decided to get their views on the subject—as well as their ideas as to what *MicroTimes* as a magazine ought to be doing to serve their needs.

There were quite a few surprises. Most predictably, the group seemed divided almost 50-50 between DOS and CP/M users, with a significant number of people who used both systems. Most of those who had migrated to DOS seem to have made the move because it made it easier to work on the same files at home and at work. Most of the CP/M faithful seemed to use their machines chiefly for word processing.

As for the death of CP/M, though, it seems to be a very lively corpse. One member who'd brought his Commodore 128 to the meeting maintained that there was considerable interest in the operating system among new Commodore users, to the degree that one San Jose Commodore group is affiliating its CP/M SIG with the national FOG organization (there were no Apple II users at this particular meeting, though there's a significant number of users running CP/M on their IIs, too).

Another member pointed out that, despite the dearth of general-purpose commercial software for CP/M, there was still vigorous development of CP/M-based vertical applications, notably industrial control systems. Yet another painted a glowing picture of a network on the UC campus that links CP/M, MS-DOS and UNIX machines to a single VAX. (Intrepid writers will bring you details in future issues.)

One gentleman offered an interesting perspective on the software-shortage issue—it seemed that he and his buddy had sat down and written a simple-to-use program that performed those loathsome mathematical calculations like amortization of loan payments and the like. "You ought to see it," he enthused. "I'm a financial idiot," I demurred. "Then you're just the person who ought to be using it!" he countered. Anyway, the authors had had a discouraging time of it trying to sell this program, simple, written-in-BASIC, but useful as it was, and didn't see much commercial potential. "Uh, what about shareware? The first *PC-Talk* was written in BASIC and it did ok . . ." "What's shareware?" said the author.

There ensued a lively discussion of free/share/beggarware, amid many tales of riches and ruin, and also a certain amount of speculation about why this marketing approach is so prevalent in the DOS world and so un-prevalent in most of the other computer universes.

No earth-shaking answers were reached, of course, but everybody seems to have gone home with plenty of new ideas to think about. I know I did. Thanks to **Pat Watters** of East Bay FOG for the invitation that made this evening possible, and to **Jean Koch** for the ride to the meeting, my car having gone to Honda Heaven.

By the way, interested parties in the Bay Area are invited to the June meeting of East Bay FOG, when the featured speaker will be **Adam Osborne** himself, who brought forth the Osborne computer and subsequently migrated DOS-wards. Osborne's renowned Way With Words aside, discussion promises to be lively, since he's been proclaiming the death of CP/M for quite some time now. The meeting will be June 10 at EBFOG's new meeting location at the Apostleship of the Sea in Oakland. Call (415) 272-9099 for information.

In other news: **David Gray** would like computers-and-music enthusiasts to know about the **Computer Music Users' Group,** which started life as a SIG of the Berkeley Macintosh User Group. Now, says David, "we have allegiances to no one manufacturer of computers, electronic music equipment, or software. Meetings usually feature one product, presented by the developer or a representative. Occasionally we feature special manufacturers' presentations—past presentations have included Digidesign, Ensoniq, and Axxess (the mapper)."

He continues, "We usually meet alternate Saturdays at Leo's in Oakland at 10 am. We are compiling a sample (Digidesign format) library and libraries for popular synthesizers." Leo's Audio and Music Technologies, the meeting location, can be found at 5447 Telegraph Avenue, Oakland. The phone number is (415) 652-1553, and either David himself or **Bill Thompson** will be glad to answer your questions. Meetings, incidentally, are free.

Michael Banyacki of Mission Viejo is starting a **Leading Edge** user group thereabouts. Plans include training in DOS, *Framework*, and *dBASE III+*, as well as utilities and public domain software for members. Call (714) 770-3172 and leave your name and phone number if you'd like more info.

The ever-enthusiastic **Helmi Kobler** wants me to remind you about the **Atari Expo** at the Santa Clara Convention Center June 18 and 19. Exhibits, seminars, giveaways and speakers galore. Check it out, and call Atari at (408) 745-2000 for further info.

And as long as we're talking about those machine-specific expos we know and love, **AppleFest** returns to the Bay Area September 18-20 in the San Francisco Civic Auditorium. Thanks to **Bill Cleary** for the early notice—you can call (617) 271-0400 for more information.

This month brings us more interesting BBS listings. **Mark Smith** of Berkeley sends word of the **Feminist BBS** in Chicago, which is looking for new users. Says Mark, "One user just called Fem BBS 'an intellectual oasis in the CompuDesert,'" which ought to justify a call or two. The sysop is **Susan B. Anthony** (**Linda Grossman** to her friends), ably assisted by **Colleen Devlin.** You can reach the Feminist BBS at (312) 225-9138—it runs 24 hours a day at 300/1200 baud, 8-N-1.

Forrest Litke invites you to the **Long Beach Bulletin Board,** which has been entertaining 3000+ users for the last three years. Special interest sections include CAD/CAM and MIDI, as well as classified ads, games, and discussions. LBBB runs 24 hours a day, 300/1200/2400, 8-N-1, at (213)438-6783.

The Landing Strip BBS (213/597-7773) is dedicated to aviation and online adventure games. It offers aviation-related downloads for IBM computers and also offers downloads for Apple II and Commodore 64 machines. It runs at 300/1200 baud on WWIV software—"the state of the art in BBS systems," boasts sysop **One-Eight Charlie.** And the **Teenplex BBS,** a board devoted to teenagers, offers message bases on general, games, hardware, software, and consulting. It also supports Commodore and Atari file transfers. You'll find this board at (818) 289-6840, 300/1200, 24 hours.

Then there's **Uncle Tim Beckwith,** somewhere out there in the 916 area code, who invites you into **Uncle Tim's Hot Tub BBS,** which he characterizes as "a clothing-optional experience coming live from Almost-Elk Grove, California." Sub-tubs include Amiga, Naturism/Nudism, C Language, Politics, Other Boards, and the always-popular Tasteless Tub. For this never-to-be-forgotten experience, call (916) 689-4670 any time. The board runs at 300/1200, 8-N-1.

That's about it for now. Keep those messages coming, electronically to The WELL (415/332-6106—send mail to **microx**) and otherwise to 5951 Canning St., Oakland, CA 94609. See you next month! ☐

BULLETIN BOARDS

065

Remote Bulletin Board. (065) 242-7669 (Singapore). 24 hours, N-8-1, 300/1200/2400, UL/DL 67 meg. Sysop: Umar A. Rahman.

206

The Board Of Review. (206) 361-8018. 300/1200 baud, 8-N-1, 24-hours, Commodore. Sysop: Ron Strauss. .

28 Barbary Lane. (206) 323-2828. 300/1200 baud, 8 bits, 1 Stop Bit, Full Duplex, No Parity, 24-hours. Sysop: Mrs. Madrigal.

209

Region 7 TEC Center BBS. (209) 571-5085. Specializing in music and schools. 24 hrs, 300 baud. Sysop: Dan Guerra.

Inn Finity BBS. (209) 521-6240. Inn Finity is an Atari based BBS. Operates on a 130XE with 320K. Signalman 300/1200/2400 baud, 24 hours a day. ATASCII—ASCII. Sysops Buzz and Jann Kelley.

Bullseye BBS. Stockton, CA. (209) 474-FIDO. IBM and compatibles. 300/1200/2400 baud. Open 24 hours, 8-N-1, FidoNet 161/31 Valley PCUG. Sysop: Bob Loeber. Validation required. Lots of MS-DOS shareware.

The Spotlight BBS. (209) 368-5591. 300 baud, 24 hours, 8-N-1, dual drive Commodore 64 operated. Sysop: The Spot.

213

Aware II (213) 851-0780. Sports BBS with different discussion boards centered around USFL, baseball, etc.

Marina Matchup (213) 397-6300. This Mar Vista-based dating board operates with Martian software.

Lynzie's Motherboard (818) 508-6482/(213) 650-0519. 24 hours, 300/1200/2400 baud, 8-N-1. Private E-mail, download library, dating matchup, interactive chat between users, 4 phone lines on rotary. Public boards include employment, food and restaurant reviews, sci-fi, political, debate, for sale and many more. Monthly social happenings for local users. Sysop: Lynzie Flynn.

Bulletin Board System. BBS devoted to handicappers and racing fans in So. Cal. On line every weekend. Log-on: race data for Santa Anita, Hollywood Park and Del Mar. (213) 934-6026.

Videodrome BBS. Where computers and video meet. (213) 324-5882. Open weekdays 4 pm - 2 am, weekends 12 pm - 2 am. A Commodore 64 system.

HUG1. The official BBS of the Hollywood Commodore User Group (HUG). All HUG members and visitors are welcome to drop by. (213) 874-8256.

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International Collectors Network. Coins, stamps, baseball cards, books, records, antiques and anything collectable can be bought, sold, or traded on the International Collectors Network BBS. Regional lists of collector events and shows in many categories. Also names and addresses of many collector organizations. Accessible using PC Pursuit. Data phone available 24 hours, 7 days at 300/450/1200/2400, 8, N,1. (213) 204-0646.

The Computer Consultant's Network, (213) 479-4074. Running a modified version of Martian! Software. 24 hours a day. This is not a job board, but merely a place for computer professionals to network and share information.

Computer Conference Center. (213) 212-5267. TBBS w. Commodore, IBM, TI, Atari, Epson, Apple etc. sub-boards. Large DL with CP/M, MS-DOS and TR-DOS programs. Laurie Flood, sysop.

Hughes Aircraft Message Service. Uploads and downloads for Mac, IBM, Commodore, Atari, etc. Public message boards. (213) 549-9640. 300/1200, 24 hrs., 7 days.

Monolith-1.7 great public boards, private electronic mail, social events. (213) 659-JEDI. 24 hours, 1200/300. Sysop: Erik Goldman.

Mid-Cities Atari ST BBS. 300/1200, 8-0-1, 24 hours. (213) 867-1943. Sysop: Darin Ferraro.

PC Heaven. A multi-computer BBS that features downloads for many different PCs. E-mail, files for various machines, general to SIG message bases. No fees, no special application request forms. Just a fun BBS for everyone. (213) 374-7929. 300/1200, 7 pm-7am M-T, 24 hrs. F-S-S. Sysop: Tony Reeves.

Tele-Web. (213) 372-4050. 300/1200, 7-1-N, 24 hours, multi-user. **MicroTimes Electronic:** Southern California edition of *MicroTimes*. Articles, events calendar, BBS and user Group listings for Southern California, classifieds. Type GO MICRO. **Home Loan BBS:** Up-to-date home mortgage rates supplied to you by Pacific Mortgage Group, a company that prides itself in getting you low mortgage rates. Rates are updated weekly. Type GO LOAN. **Dining-Line:** South Bay database of online restaurant menus. Menus may be searched by type of cuisine, price of a meal, name of restaurant, etc. Database includes complete menus and a community forum. Type GO FOOD. **LA Weekly Electronic:** electronic version of LA's largest weekly entertainment newspaper. Includes feature articles, calendar and events listings, classifieds and more. A new edition each week. Type GO WEEKLY. **Easy Reader Electronic:** electronic edition of the Easy Reader newspaper. Includes feature articles, weekly calendar, night club listings and classifieds in over 80 categories. Type GO EASY. FREE.

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Jukebox Bulletin Board (JBBS) (213) 670-8053. 8-N-1, 24 hours, 7 days, 300/1200 baud. Message board for buyers, sellers, and anyone interested in antique jukeboxes. Free. CP/M password available on request. No Fees. sysop: Ray Etchepare.

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Bloom County "Nochange" BBS. (213)615-0528, 8-N-1, 24 hours, 7 days, 300/1200 baud. Bloom County is an IBM BBS running Nochange software. This system features online games, file uploading/downloading and the best e-mail system around! Call and join our Quarton-The Later Years D&D message base. Sysop: Brody Schiess.

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CompuCenter Long Beach. (213) 421-1041. 8-N-1, 24 hours, 300/1200. Multi-interest board in Long Beach with everything from Aviation sub-board to Mature Topics and IBM, C64/128, and Amiga. Sysop: Ken Cothern.

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BBS-64 Shopper. (213) 598-5841. 8-N-1, 24 hours, 300/1200 baud. Sysop: Scott D. Edson.

K&L Tele-Catalog. (213) 327-2255. 24 hours, 300/1200, 8-N-1. 27 sub-boards including electronic and computer shopping, general board, game boards, club boards, classifieds, tips and tricks. No fee. Sysops: Louis B. Dubin, John Altpeter.

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LAAUG-LINE. (213) 559-7367. 300/1200, 7 days a week, 24-hours. Sysop: Gary Woolard.

Hollywood Commodore User Group Hug #1. (213) 466-3049. 8-bit, no parity, 1 stop, 24-hours, 300-1200 baud, running on C-NET. Sysops: Joss A. Vazquez & Zed Yago.

Alinco Ind. RBBS. (213) 402-4716. 300/1200/2400 baud, N-8-1. Upload and download of public domain files. E-Mail, conferences: games, communication and technical references, systems and peripherals price list. This is a totally new board. Sysop: Albert Chang.

Long Beach AIDS Information BBS. (213) 663-2025. 24-hours, 300/1200 baud. Information on AIDS issues, expecially experimental drug therapies. Also serves as a forum for discussion. Sysop: Ken Ragge.

The Long Beach Bulletin Board. (213) 438-6783. N-8-1, 24 hours, 300/1200/2400 baud. The Long Beach Bulletin Board has been in operation for over three years supporting 3000 plus users. We have over 60 megs online with over 1500 files for downloading. Special Interests Groups include AD for BBS notices and sale items, CD for all CAD/CAM applications, COMM for discussing communications topics, GAMES, MIDI and STARFLT. All SIGS are open to the public. Call one of Southern California's oldest RBBS systems in operation. Sysop: Forrest Litke.

Landing Strip. (213) 597-7773. 300/1200, 24 hours, WWIV software. A computer board service dedicated to aviation and online adventure games. Features aviation related downloads for IBM computers and has download areas for Apple and C-64. Unique online games that must be played to be fully appreciated. Sysop: One-Eight Charlie.

CompuCenter/LA. (213) 435-3757. N-8-1, 24 hours, 300/1200 baud. Multi-user board including conferences for Amiga, IBM, C64, C128, TRS-80. Reviews of software and hardware. For Sale section and much more. Up/download sections for all listed. Sysop: Rick Gaspa.

Chat Line. (213) 534-4311. 24 hours, 300/1200 baud. Multi-line, multi-user. Interactive chatting between online users. Downloads for all popular computers. Innovative and informative public message exchanges. E-mail. Sysop: Tony Broderick.

312

Feminist BBS. (312) 225-9138. 8-N-1, 24 hours, 300/1200 baud. Feminism, women's issues, general talk. Sysop: Susan B. Anthony.

408

Atari Base BBS (408) 745-5308 or (408) 745-2642. 300/1200 baud, any time, any day. The official BBS of Atari Corp, for all Atari computers.

Byte Bandits ColossusNet. (408) 374-3974, 300/1200, 24 hours. Network USA. Sysop Sam C. Brown.

Evergreen PC Users Group (EPUG-1) (408) 270-4085, San Jose. 8-N-1, 1200/450/300 baud, 24 hours. Sysop Bob Allen. 32 megabytes online, 34 directories created by Special Interest Users.

Bizcomp BBS. Sunnyvale, CA (408) 720-9212, 300/1200, 24 hours. Message base specializing in modem technical help, with a special message conference for sysops. No file transfers available. No registration fee, but requires home & business phone numbers on first call.

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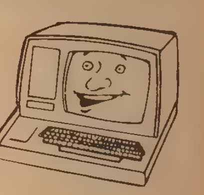

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Sat. June 20-
Ventura Computer Show & Sale
Ventura County Fairgrounds
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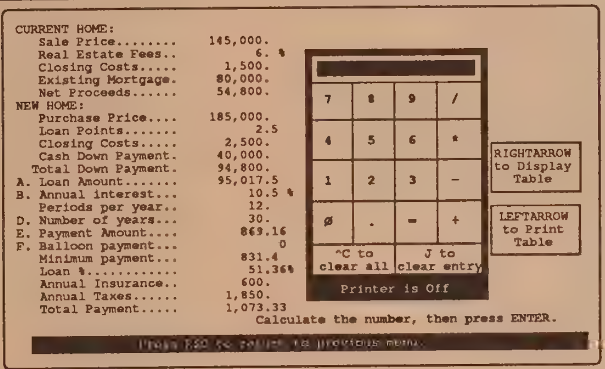

```
CURRENT HOME:
   Sale Price........      145,000.
   Real Estate Fees..           6. %
   Closing Costs.....        1,500.
   Existing Mortgage.       80,000.
   Net Proceeds......       54,800.
NEW HOME:
   Purchase Price....      185,000.
   Loan Points.......          2.5
   Closing Costs.....        2,500.
   Cash Down Payment.       40,000.
  Total Down Payment.       94,800.
A. Loan Amount.......       95,017.5
B. Annual interest...         10.5 %
   Periods per year..          12.
D. Number of years...          30.
E. Payment Amount....       869.16
F. Balloon payment...            0
   Minimum payment...        831.4
   Loan %............        51.36%
   Annual Insurance..          600.
   Annual Taxes......        1,850.
   Total Payment.....     1,073.33
            Calculate the number, then press ENTER.
            Press ESC to return to previous menu.
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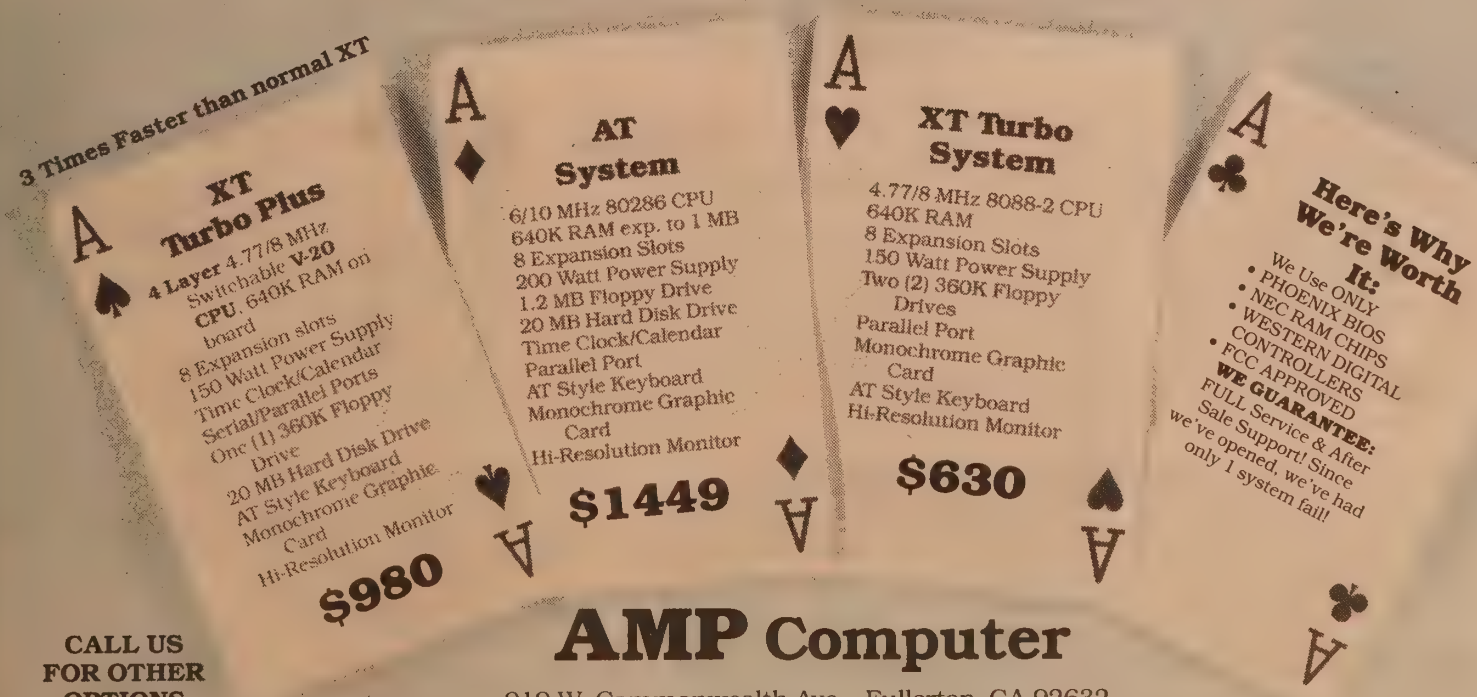

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Home Board (408) 277-0106 no fee. A non-profit BBS focused on housing issues in Santa Clara County. 1200 baud, 24 hours M-F (8 am Monday through 5 pm Friday). Sysop: Charlie Chew.

Board III (408) 985-7573. 300/1200 baud, 24 hrs., 8 bits, no parity. Board III is an ongoing experiment in telecommunications. Atari-based, but all computers welcome. Sysop: "The Chairman."

ADV in Lrn (408) 247-4769.

The CATS BBS (408) 356-8902. Computer Assisted Typography Service Typesetting BBS. Online tutorial of PC typesetting, public message bases, 300 baud only.

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The Man O'War, (408) 243-2370. 24 Hours, 300/1200 baud. Over 52 message bases, organized activities. A member of the Silicon Valley Sysop's Exchange.

Silicon Valley Sysop's Exchange. Merlin's Castle BBS (300 baud only), (408) 578-1563. Sharks Head BBS (300/1200 baud), (408) 247-4810. The Man O'War (300/1200 baud), (408) 243-2370.

SDI Clearinghouse BBS. Morgan Hill, CA, (408) 778-3531, 300/1200 baud, 24 hours. Supports the L5 Society in promoting the development of space.

The Shark's Head BBS - Something for everyone, from serious to ridiculous. No-fee, membership system. We're not only user friendly, we're friendly users. Member SVSE. Dusty & Candy Van, (408) 247-4810.

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SOFTREK. (408) 438-6506. 8-N-1, 24 hours, 300.1200 baud. Sysop Mike Floyd.

Hotel California. (408) 942-1081. 24 hrs., 300 baud, Commodore oriented.

The Flying Fido. Fido network 143, node 23, is now up and running 24 hours per day, except during FidoMail. 300/1200 baud, (408) 946-3183. Special interest in aviation; ul/dl of pd software. Free.

Association of Apple 32 Users BBS. (408) 263-0299. 24 hrs., 300/1200. Sysop: John Griffith.

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The Snake Pit BBS. (408) 266-5895, 300/1200, full duplex, 8 bits, no parity, 1 stop, 24 hours. Commodore ul/dl.

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Tele-Play. (408) 723-9003. 24 hrs, 300 baud, program matches parameters. Sysop: "Titan."

Consumers BBS and Insurance Center, Sunnyvale. (408) 732-4126, 300/1200 baud, 8-N-1, 24 hours. Rate your own home and auto insurance with one of the nations's top 5 insurance companies. Apply for a car loan with Lloyd's Bank. Get the Dealer's cost on new cars. See if your auto has been recalled. Buy or sell a car. Free, no passwords, no time limits. Sysop: Al Moskal.

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The PET Sematary. (408) 263-3486. Commodore specific, X-Modem, Punter files, XSee. 300/1200 baud, 8-N-1, weekdays 5 pm-10 pm, weekends 10 am-10 pm. Sysop: Grave Robber.

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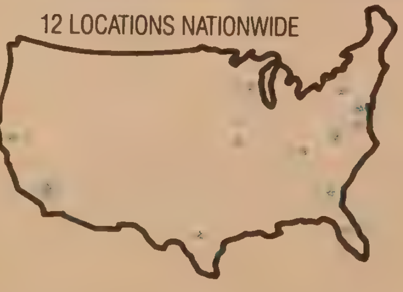

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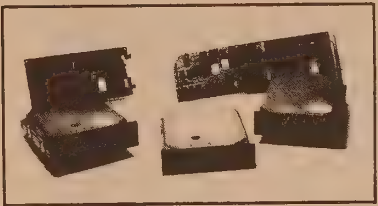

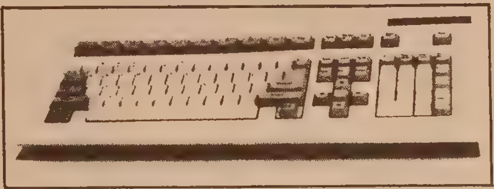

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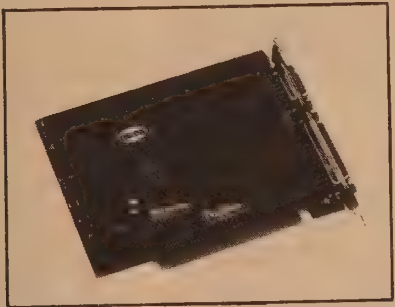

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Humor & Wisdom. A board dedicated to the exchange of comic relief and things to ponder in a new age of consciousness. Free, as all things should be. 300/1200 baud, (415) 937-2508.

Open Campus BBS (415) 895-0135. Operated by San Leandro High School and Apple Eaters Users Group, 5 meg, 20 message bases plus library. 24 hours, 300/1200. Sysop: Bob Shayler.

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Guideboard, Cabbie's Guide to San Francisco. Where to go for restaurants, doctors, auto repair, etc. The sysop gets his tips from driving a cab; the callers furnish the rest. The BBS also has an resident astrologer, Swami Tommy. The Swami gets his tips from the stars. Ask him any question. (415) 864-3858, 300/1200 baud.

Entrepreneurs BBS: Official BBS for Community Entrepreneurs Organization (CEO), and XT Compatible Club. 1200/300 baud. 24 hours, 20 megs., 8 bits, no parity. Entrepreneurial networking and information, brainstorming, and on-line support for IBM XT clones. Sysop Edwin Rutsch. (415) 552-9070.

APT Action BBS. C64 board dedicated to exploring on-line entertainment. Free ACTION-AUT software. 24 hours, 300 baud, (415) 322-3213.

RSVP BBS. (415) 659-9169, 300/1200, N-8-1. 24 hours. Sysop Jim Thomas. FAUG Amiga User Group discussion and file area, Dr. Who forum, Sanyo, IBM, CP/M files, CP/M forum, Ohlone College forum.

Marin Community BBS (415) 459-3326. 300/1200 baud, 6 pm - 10 am M-S, all day Sunday. 520 ST/Atari information. Sysop Dave Powers.

MacCircles EBBS (415) 484-4412. 24 hours, 300/1200/2400. Running Red Ryder Host software on a Lisa 2/10 (Mac XL). Large software exchange, private mail system, public messaging.

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619

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805

Thousand Oaks Technical (805) 493-1495. This massive 64 megabyte board has a mind-boggling number of downloadable programs. The board has no bulletin board feature and allows unlimited upload time. Download time is limited depending on upload exchange.

KERNCOM. (805) 322-8800. 300/1200/2400 baud, 24 hours, 7 days. KERNCOM has operated continuously since March 1983 for the IBM community. KERNCOM is owned by the Kern Independent PC Users Group and is never off line except for routine maintenance. Sysops: Rick Heming and Jim Harrer.

CCCUG BBS. Central Coast Commodore Users Group. (805) 934-2216. 24 hrs/7 days, 300 baud, Punter BBS protocol for downloads. Sysop: Greg Johnson.

PC Vision. (805) 487-3149. 300/1200, 8-N-1, 40 megs. PC-, MS-DOS programs. Sysop: Frank Driscoll.

Tech-Talk. (805) 922-5488. 300/2400 baud, 24 hrs. 21 meg pd software on a 63 meg system. Online registration, instant access to all files, MS/PC-DOS, CP/M. Sysop: Jerry D. Russell. Public access "Collie ver. 1.2."

CompuLink Fido. (805) 494-3350, 300/1200/2400 baud, 24 ours except during netmail. Huge selection of ham radio files; other features include echomail, Outside, and role-playing games (StarTrek, Gamma World, Champions, AD&D, more!!). 20 megs—call today! Sysop: Eric Daymo.

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Affection Connection. (805) 527-7464, (818) 704-8588. 24 hrs., 7 days, 300/1200 baud. Multi-user BBS offering live on-line chatting, matchmaking. Sysop: Devin Woods.

818

Granada Engineering Group RCP/M (818) 360-5053. Technical information, BBS lists, and help on CP/M assembly language program writing.

Oracle BBS (818) 980-6743, system password MICROTIMES, is a multi-interest, multi-user BBS running 6 phone lines on a CompuPro. Features include 8K messages, comments on messages, match-maker, adult material section, online CHAT between users and much more. 24 hr., 300/1200 baud.

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Warren Communications Network. TI BBS, 24 hours, 300/1200 baud, graphics, speech, downloads. Sysop Douglas Davis. (818) 361-9294.

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Light Artists, LTD. (818) 985-0541. 24 hrs, 300/1200/2400 baud. Sysops: Marty and Gerald Lehtola.

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The Dugout. (818) 248-0562. Operates at 300 baud on a TI-99/4A but welcomes all systems. Includes message base, computer events, on-line adventure, xmodem d/l, and more. 6pm-11pm daily. Sysop: Jim Edwards.

The Talk Channel. (818) 506-0620. 24 hours, 300/1200. Sysop: Gary Clarkson. A multi-user, multi-interest system featuring chat on-line with other users. 20 public message boards, including movie previews, casting calls, dining tips, debate and dating boards. 4 questionnaires, one that you answer in your own words, 3 optional. Extremely fast operation on 22 meg hard disk drives.

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Wizard of Osz RBBS. (818) 709-6978. 300/1200/2400, 24 hrs., CP/M or MS-DOS. Sysop: Mat Satuloff.

Atari Resource Magazine (ARM) (818) 446-5813. 24 hrs., 300 / 1200. Currently serving Atari and IBM computer users. Eleven message bases: general chatter, hangouts, advertise, for sale, XE Atari, ST Atari, modem, ul/dl, other BBS #s, Bible, job board. Sysops: Bob and Kim Reynolds.

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The MacLodge BBS. (818) 444-9850. 8-N-1, 40 megs, 300/1200/2400. Hours M-F 3:30 pm-7 am; 24 hours on weekends and holidays. Macintosh up/downloads, plus Mac info. Mac users only please. Sysop: Dennis Cosio.

Greycastle BBS. (818) 796-5042. The bulletin board of the San Gabriel Valley Macintosh Users' Group. Operates 24 hours per day at 300 or 1200 baud. 5 megabytes available for 8 sub-boards, XModem file transfers on SnAPP software. Sysop: Bryan Menell, CompuServe ID 72307,2100, GEnie ID B.MENELL.

The Outpost RCP/M. (818) 353-8891, 300/1200 baud, 24 hours. Online games, occult and general text files, CP/M, Turbo Pascal. Sysop: Phil Hansford.

AT&T PC6300 Users' Group BBS. (818) 954-0530. 300/1200 baud, 8-N-1, 24 hours. Only So-Cal BBS "officially supported" by AT&T. Sysop: Eric L. Levinson.

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AMP PC-RBBS. (818) 570-4406. 300/1200, 8-N-1, 24 hours. For IBM, program downloads and uploads, personal mail, public message system, 40 megs, no fee. New open sale conference for free for sale or wanted ads. Computer products offered at low price. Sysop: Edward Lee.

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916

The Vortex BBS. (916) 481-0194. 24 hours, 300/1200 baud. Online and RPG games, new ones start often. Message boards include private mail, Dr. Who, game hints, endless story, play by mail. Vote on movies and weekly survey. Articles and BBS listings. No Fee. Register first call. Pamela Lunsford, sysop.

"The Meeting Place" BBS 300/1200/2400 baud. 24 hours, no parity. AE line for public domain downloads. Apple, Commodore, IBM programs available for download. Numerous general files. No fees, all free. Call (916) 662-1838. Woodland, CA.

Family Radio Forum. (415) 562-5483. 300/1200/2400, N-8-1, 24 hours. Download, upload, message, conference on parenting. For teens, singles, etc. Christian TBBS for everybody. Sysop: Richard Yim (voice 415/568-6200). Also (301) 261-1423 (Annapolis, MD), (712) 246-2115 (Shenandoah, IA), (916) 481-6320 (Sacramento, CA), (201) 736-1859 (Newark, NJ), (813) 269-7957 (Okeechobee, FL).

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ASSOCIATIONS

Computer Professionals for Social Responsibility. The LA chapter is interested in computer reliability and preventing nuclear war, the socially useful direction of computer research, and similar topics. They meet most third Wednesdays at 7:30 pm at varying locations. Contact Rodney Hoffman, P.O. Box 66038, Los Angeles, CA 90066, (213) 932-1913 for more information.

Organization of Professionals, Educators, and Novices (OPEN). Tutorials, random access period, feature presentation, public domain library, and CP/M literature are all part of the monthly meetings of Osborne owners/users and MS-DOS transportables. Club BBS and newsletter. Call Frank L. Christ at (213) 498-4186 for more information. Meetings at Learning Assistance Center, CSU Long Beach, 3rd Wednesdays, 7 pm.

The North Orange County Computer Club. This group is the largest and perhaps the oldest in the county. It is affiliated with a large number of special interest groups and offers something for just about every user. General meetings are usually the first Sunday of every month in the Hashinger Auditorium, Chapman College, Orange. For info, call (714) 998-8080.

The South Orange County Computer Club. A general computer club that meets the first Tuesday of every month at 3545 Harbor Blvd., Costa Mesa. Meetings begin at 7:00 P.M.

Valley Computer Club. Monthly meeting at 7 pm, first Wednesday of month in Burbank Board of Realtors Bldg., 2006 W. Magnolia Blvd., Burbank. All types of micros represented. Contact W.R. Robinson, 11850 Louise, Granada Hills, CA 91344, (818) 368-1383.

INTERFACE is a Los Angeles area gay and lesbian computer users' group for socializing and exchanging information. Meetings are open to all, regardless of level of experience. There are no dues or membership requirements. For additional information call Jim (213) 664-1127 or Pam (818) 368-0437.

San Diego Computer Society. Umbrella organization for over 40 Special Interest Groups (SIGs). Sponsors meetings, newsletters and annual computer fair. Meetings at Mesa College, 7250 Mesa College Drive, San Diego, 11:30-4, third Saturday each month. Contact Membership Chairman, P.O. Box 81444, San Diego 92138, (619) 549-3783. BBS (619) 549-3788.

Consolidated Computer Club. Meets first Fridays. 7 pm, Progressive Savings Bank, 12175 Ventura Blvd., Studio City, CA. Dues $25 yr. Send SASE to David Nussbaum, 11558 Riverside Dr., #207, North Hollywood, CA 91602.

Professional Typists/Word Processors Network to meet Sept. 9, 7 pm at Santa Monica Montessori School, 1619 20th St., Santa Monica. Network was formed for homebased typists and word processors to share information and referrals. Meetings consist of outside speaker and networking. $2 per meeting. Contact Fran Brevig, 6399 Wilshire Blvd. #1A, Los Angeles, 90048, (213) 651-1479.

Hughes Aircraft Computer Clubs. This club is for Hughes Aircraft employees only, but the BBS is open to everyone. Upload and download boards for Macintosh, IBM, Atari, Commodore, etc. Each board has its own public message service plus general message board. Contact Bud Grove, 21111 Dolores #146, Carson, CA 90745. BBS (213) 549-9640, 300/1200 baud, 24 hrs., 7 days.

Ventura Personal Computer User's Group. All MS-DOS and PC-DOS machines. Meetings 3rd Saturday 9 am-12 noon, Foster Library, 651 E. Main, Ventura. Contact Mike Regan, President, 301 Dana Point, Ventura, CA 93004, (805) 647-8273.

Micro User's Group — SFV Board of Realtors. Meetings 7232 Balboa Blvd., Van Nuys, 7 pm. third Thursday. Contact Mary Lou Williams, (818) 786-2110 for more information.

South Bay Computer Education Group. Supporting Apple, Atari, Commodore, IBM and compatibles, and TI99/4A. Meeting 2nd Wednesday of each month. Time 7 pm at 3675 Torrance Blvd., Suite 202, Torrance, CA 90503. Contact Jack Ward (213) 530-4879 or Judy Adams (213) 540-5010.

UCLA PC Users Group. IBM PC or compatibles owners welcome to join us on the 2nd Tuesday of the month, 7 pm. Public domain library , SIGs, BBS, seminars and newsletters. NPI Auditorium, UCLA, Westwood Plaza, Level C. For more information call (213) 473-6668.

Citizens Veto. For users with an interest in socio-economic issues who might want to try their equipment in working a model of a new approach. Primarily graphics and numbers, minimal text. Ewald O. Schlachter, (415)452-0151.

Pro*BUG—Professional Business Users' Group. Formerly Xerox Users Group. Meets 1095 Irvine Blvd., Tustin, 1st Saturday each month, 9 am. BBS (714) 543-3187, 300 baud, X-modem protocol. CP/M, PC, MS-DOS. Contact Allen Ashley, (714) 537-4608.

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and provide group benefits to members. Meets at Revere House, Tustin, 2nd Thursday, 6 pm. Contact Bill Creel, membership chairman, ICCA-OC, P.O. Box 3067, Santa Ana 92703, (714) 666-1981.

LAC-BUG (Learn About Computers — Beginner's Users Group. All computer owners and prospective owners eligible, ages 3 to adult. Educational materials and hands-on training included with membership. 24 hour telephone: (213) 372-8909. Mailing address: 6506 Arizona Avenue, Suite 127, Los Angeles, CA 90045.

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Network Users Association. 2111 Eisenhower Ave., Suite 400, Alexandria, VA 22314. (800) 638-8510 or (703) 683-8500.

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Apple Co-op. 290 SW 43rd, Renton, WA 98055. (201) 251-5222.

JUG (Jefferson State Computer Users Group). Many SIGs, newsletter. Dues $5.00 year, some SIGs additional. Contact JUG, P.O. Box 457, Gold Hill, OR 97525-0457.

MicroPro Users Group of America. National group with over 200 members worldwide. Dedicated to supporting MicroPro products, especially WordStar and InfoStar, for any hardware. c/o Procyon Associates, 140 Riverside Drive, New York, NY 10024. (212) 595-4811.

Golden Apple Club, Apple II and Macintosh. Contact Stefano Minotto, Golden Apple Club, Riviera Tiso da Camposanpiero, 26, 35100 Padua, Italy.

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Getec s.r.l. Contact Silvio Esengrini, Via dei Guarneri Nr. 24,-20141 Milan, Italy. Phone: 39/2/5696502, 39/21 5694185.

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PLUG (The Plus/4 Users' Group). Dedicated solely to support of the Commodore Plus/4. No regular meetings, 200 members in US, Canada, Mexico, and Europe. Newsletter, public domain software library. P.O. Box 1001, Monterey, CA 93942.

KAPPA (Memphis Kaypro Users Group). Meetings at 2 pm, 1st Saturday of the month, Room 2, Jennings Hall. Contact Hugh Lamar, 5983 Macon Cove, Memphis, TN. (901) 377-4140.

The AppleWorks Users Group (TAWUG). c/o Regional Rep, 27421 Berenda Way, Hayward, CA 94544, (415) 887-7499.

FORTH Interest Group, International Office. P.O. Box 8231, San Jose, CA 95155. For further information call (408) 277-0668.

Apricot User Group (APRICUG). Box 98, Malverne, NY 11565.

Spellbinder Users' Group has an international newsletter with useful macros written by members, advice on new applications, news, and word-processing problem solving. All experience levels. California members welcome. Write P.O. Box 14, Newark, Notts, England NG24 4TP; telephone (0636) 77313; telecom Gold/Dialcom Mailbox 72: MAG95610.

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National TeleVideo Users Group. Meets 7:30 pm, 3rd Thursday, 1170 Morse Ave., Sunnyvale. P.O. Box 22007, San Francisco, CA 94122. Call for info — David, (415) 753-1552.

Apple Fontrix Club. Monthly newsletter. P.O. Box 29857, Thornton, CO 80229-0857.

N.A.B.V.I.C.U. - The National Association of Blind and Visually Impaired Computer Users. The purpose of this group is to gather information that will assist the blind or visually impaired person in utilizing the enromous potential of computers. It supports **CompuHelp**, a menu driven database-bulletin board programmed for use by the blind and visually impaired. It is available 24 hours a day, 7-days a week, 300/1200 baud, 8 or 7 bits, even or no parity, 1 stop bit. (916) 786-3923. Compuhelp is also available on disks. For more info, contact Otto C. Haiungs, Chief Executive Officer, Sysop, at P.O. Box 1352, Roseville, CA 95661-1352. (916) 783-0364.

28 Barbary Lane. Meets at 121 13th Ave. East, Seattle, WA, Fridays 8:00 pm. Contact A. Madrigal, (206) 323-2828. BBS: (206) 323-2828.

Microenvironmental Information Consortium For Researchers Overseas. World Headquarters, 712 Avery Rd. W. Winlock, Washington 98596, USA. Washington phone: (206) 262-0159. California phone: (415) 524-9309. Micro on MCI mail, ECONET & WELL TELEX number 6502928733 via WUI.

USER GROUPS

AT&T

AT&T PC6300 Users' Group. Meetings at various locations — contact BBS for latest information. Or write Eric Levinson, P.O. Box 7364, Burbank, CA 91510. BBS (818) 954-0530, 300/1200, 8-N-1, 24 hours.

ORCA - Orange Riverside Counties AT&T 6300 UG. Meetings bimonthly, second Saturdays, 11:30 am, at 2144 Michelson Drive, Irvine. Contact Chuck Patten, 1220 Page Circle, Corona, CA 91720, (714) 851-0119, ext. 234.

ADAM

Adam Users of Southern California. Come and keep the ADAM going. We have access to some of the people who developed software for ADAM and we are going to create a base for tips, reviews, and a BBS. Get on line with ADAM. Meetings at Airport College Center, Sepulveda and Century, 4th Sunday, noon. Contact Harvey Klein, 1736 S. Bedford, LA, (213) 553-1062 or Paul Shecter, 5545 Lindley, Tarzana.

ALPHAGRAPHICS

Alphagraphics. Contact Stella or Jim Muller, 16425 Bernardo Ctr. Dr., San Diego, Ca. 92128, (619) 451-2250.

AMIGA

Amiga Friends (AF). Contact Russ Kavanagh, (714) 898-2947. Call for more information, we'll see you there!

San Fernando Valley Amiga User Group (SFVAUG). Meets 2nd Thursday of the month, 7-10 pm, at American Legion, 7338 Canby Ave., Reseda. We've got demos, SIGs, newsletter, PD library, disk of the month, ANSWERS. Bring your AMI, we have lots of room now! Contact Randy Likins, (818) 709-0932.

Bits & Pieces Amiga Group of Anaheim. Meets every Tuesday 6:30-10 pm at 1130-A N. Kraemer Blvd., Anaheim, CA 92806. C-64, C-128, Amiga. Public domain software, technical help, guest speakers, much more. Contact John Callaci or Mike Dalton (714) 630-8644/ 630-8711 for information.

Color America. Amiga SIG meets 1-3 pm on the third Saturday of the month at Rosemead Community Center, 3936 N. Muscatel Ave., Rosemead. For information contact Mark Randall, 2227 Canyon Rd., Arcadia, CA 91006, (818) 355-6111.

Amiga Tech Users Group #1. Meets 4th Tuesdays, 7 pm, University Union, Cal Poly Pomona. Contact Mark Randall, (818) 355-6111. Call for more information, we'll see you there!

Amiga Tech Users Group #2. Meets at Rosemead Community Center, 3936 N. Muscatel Ave., near Valley Blvd., Rosemead, 1 pm, 3rd Saturday of the month. Contact Mark Randall, (818) 355-6111. Call for more information, we'll see you there!

Inland Empire Amiga User Group (IEAUG). Meets 7 pm, 3rd Tuesday of the month, California School for the Deaf, 3044 Horace St., Riverside. Contact Paul Corbet (714) 684-6245. Call for more information, we'll see you there!

LA Amiga Users Group (LAAUG). Meets 3rd Wednesday, 7:30 pm, Veterans Memorial Auditorium, Culver and Overland Blvds., Culver City. Call (213) 387-3698 for more information. We'll see you there! BBS: (213) 559-7367.

West Side Amiga Users Group (WAUG). Meets 2nd Wednesday, 7:30 pm, John Adams Junior High School Cafeteria, 16th and Ocean Park Blvd., Santa Monica. Call (213) 451-0713, during the day, for more information. We'll see you there!

Apple/Valley Computer Club. Member interests include Apple, Amiga, IBM and others. Meetings are held on the 2nd Wednesday of each month, 7:30pm, at Valley Presbyterian Hospital, meeting room #3, 15107 Van Owen, Van Nuys, CA. For more info, contact Dr. William H. Trent, 6502 Kester Avenue, #7, Van Nuys, CA 91411, (818) 988-1752.

APPLE

Original Apple Corps. First Apple group ever. SIGs for AppleWorks, Telecommunications, Educators, Macintosh. Meetings in the Santa Monica Mall, second Sunday of the month, 3rd floor Community room, 12 noon. Contact Rich Rollons (213) 378-0707, or Fred Duffy, (213) 396-5515.

The Orange Apple Computer Club meets 9 am-12 pm the first Saturday of each month in the Science Hall at Orange Coast College, Costa Mesa. We have over 700 members, ranging from beginners to certified Apple developers, and a large Apple II public domain software library. There are several very active special interest groups which include Apple III, educators, Apple II, modem and investors. For further info call (714) 770-1865.

South Bay Apple III User Group. Over 85 Apple III users share information, programs, group purchases, product demos. Special interest groups meet 1st Tuesdays. General meetings on IIIrd Tuesdays at 7:30 p.m., UCLA Harbor General Hospital, Room III. Corner of Vermont and Carson, off 110 Fwy. Contact Gary Fortune, P.O. Box 432, Redondo Beach, CA 90277, (213) 316-7738.

Tri City Apple User's Group (Glendale, Burbank, Pasadena). New group formed from merger of Pasadena and Wabash groups. Meetings are scheduled the third Thursday of the month at Casa Colina Neurological Learning Center, 50 North Hill St., Pasadena at 7:30 pm. Contact Marie Kaden at (818) 846-6682. Dues $12./yr.

North San Diego Apple Club. Meets 1st Tuesday of each month at Meadowbrook Middle School, Meadowbrook Lane, Poway, 7 pm. Contact Bill Walker (619) 579-9649 or Chuck Newby (619) 566-0387, P.O. Box 75, Poway, CA 92064.

SD Aliiers. Want to start Apple III user group in San Diego area. Contact James Fair, P.O.

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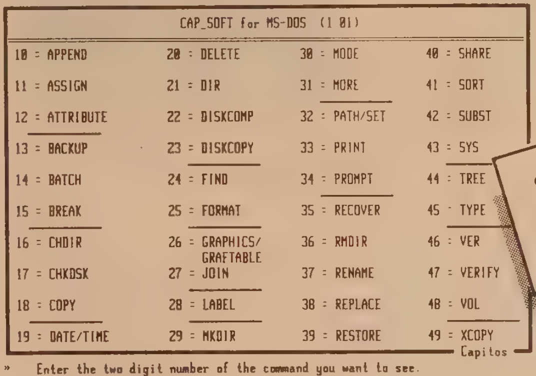

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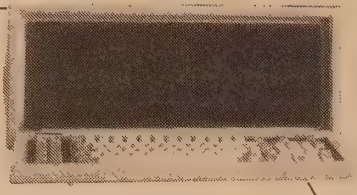

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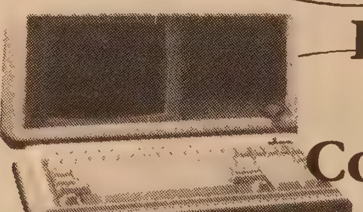

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Applejacks of the Inland Empire. Primarily for Apple II users. Meets first Wednesday and third Thursday of the month, 7-9 pm, at Norman Feldheym Central Library, 555 W. 6th St., San Bernardino. Contact Scott Zehm at (714)883-2234 for information, or write Applejacks, P.O. Box 23025, San Bernardino, CA 92406.

Appleholics Anonymous of Ventura County. Software library, club BBS, newsletter, hardware and software demos. 150 members. Meetings sometimes vary—call to verify (805) 482-3501, 484-2611, 659-5326, 985-9781. Meetings 3169 Telegraph Road, Ventura, 9:30 am, usually 2nd Saturday.

PVAUG-Pomona Valley Apple Users Group. Meetings are held on the 2nd and 4th Saturday of each month. For time and location, contact Victor Michael at(714) 629-0540.

Apple/Valley Computer Club. Member interests include Apple, Amiga, IBM and others. Meetings are held on the 2nd Wednesday of each month, 7:30pm, at Valley Presbyterian Hospital, meeting room #3, 15107 Van Owen, Van Nuys, CA. For more info, contact Dr. William H. Trent, 6502 Kester Avenue, #7, Van Nuys, CA 91411, (818) 988-1752.

APRICOT

Apricot Roundtable Group of Hapless Hackers (ARGHH!) An Apricot user's group is forming in east Long Beach, open to any Apricot, XI, F1, F2, F10 or FP user, or anyone else with MS- or PC-DOS and 3½″ disk drives. Phone Jim Bliss at (213) 425-6302. Meetings 7–10 pm, 3rd Wednesdays or at such other time as membership decides, at 7215 Killdee St., Long Beach, CA 90808.

ASHTON-TATE

dBUG-dBASE Users Group. For all levels of dBASE users from beginners to expert. Meets 3rd Monday each month, 7-9 pm, Blue Cross Bldg., 21555 Oxnard, Woodland Hills. For more info contact Bruce Ascough, (818) 789-0723.

dBASE III SIG of UCLA PC Users Group. Meets once per month in Santa Monica—date varies. Contact Tom Rombouts, 1428 N. Curson #6, LA, CA 90046, (213) 874-7471.

dVALLEY dBASE Users Group. Meets 4th Monday of the month in Van Nuys, 7 pm to 9 pm. For all levels of dBASE users. Large public domain disk library, Club Newsletter, "Fix-it-session" every meeting, group learning projects. Plus speakers and demos. For more info contact Louie Astorga, (818) 998-3210.

ATARI

Atari Computer Association of Orange County (ACAOC). Join one of the biggest Atari user groups in Southern California. Monthly magazine, large public domain library, and club BBS. Dues $24.00/year, $18.00 for non-attending out-of-town members. Meetings at Golden West College, Room 131, Huntington Beach, 1 pm, fourth Sunday of the month (ST meeting same time and place on second Sunday). P.O. Box 9419, Fountain Valley, CA 92728 or (714) 838-3099 for more information.

West LA Atari Users Group. Come join fellow Atarians! Dues are $20.00/year. Newsletter, P/D library, ATR-Sig, discounts, guest speakers. Please call for directions to meeting room! If you're reading this, you belong with us. Meetings first Wednesday of the month, 7 pm, Paul Revere Jr. H.S., 1450 Allenford Dr., Brentwood. Call John Scheid, pres., for more information (213) 829-7239.

Los Angeles Atari Computer Enthusiasts (LAACE). Join Los Angeles' largest and oldest Atari Users' Group, now in our 6th year. Enjoy our monthly meetings and newsletter. Participate in our educational SIG (Special Interest Groups) seminars and meetings. Learn how to get the most out of your Atari; access our hundreds of public domain programs; benefit from the help and experience available from our experts. Come as our guest on the 1st Tuesdays of the month (2nd Tues if holiday occurs in 1st week) at 7:00 pm at Granada Hills High School, 10535 Zelzah Ave., Granada Hills, CA. For full benefits, including member access to our 10 meg BBS, dues are $20/yr ($25 for entire family). Write P.O. Box 7752, Van Nuys, CA 91409 (include your phone number) for additional information.

Santa Clarita Valley Atari Computer Enthusiasts (SCV-ACE) invite you to join us. Meetings are the first Thursday every month from 7 to 9 pm at the Moose Lodge, 18000 W. Sierra Hwy., (1/2 mile north of Soledad Canyon Road), Canyon Country. For info call Bob at (805) 259-6540.

Atari Computer Enthusiasts Network (ACENET). Umbrella group representing many Southern California Atari groups. If you can't locate a user group in your area, contact John Tarpinian at 6055 Cahuenga Blvd., #2, North Hollywood, CA 91606, (818) 760-1831.

Hooked on Atari Computer Keyboard Society (HACKS). Meetings on the first Saturday of the month in the Burbank area. For more information contact John Tarpinian, 6055 Cahuenga Blvd., #2, North Hollywood, CA 91606, (818) 760-1831.

AA-Atari Users Group. Meets at Upland Public Library, 450 N. Euclid Ave. Atari 400, 800, XL/XE group meets second Tuesday, 6-9 pm. Call Juan Valdes, (714) 980-6841 for more info. 520/1040ST group meets fourth Thursday 6-9 pm. Call Jay McCarthy, (714) 829-8722 for more information.

MAST—Mid-Cities Atari ST. Meetings at 9025 E. Artesia Blvd., Bellflower, first Sunday, 7 pm. Contact Jane Hughes, 9701 E. Artesia Blvd., Bellflower, (213) 867-0626.

South Bay Atari Computer Enthusiasts (S.B.A.C.E.). Meets 2nd Tuesdays, 7:30 pm, VFW Hall, 1865 Lomita Blvd., Lomita. Meetings consist of guest speakers from software and hardware suppliers, demos by members, q & a periods, along with current Atari rumors. Newsletter, published 6 times a year, included with $20/yr membership fee. Write S.B.A.C.E., P.O. Box 83668, Los Angeles, CA 90083, for more information, or call Dick Reaser, (213) 645-7063.

Pasadena Area Local Atari Computer Enthusiasts (PAL-ACE). Meets monthly in the Monrovia area on the third Tuesday of the month. Contact Chris Roberts, sysop of PAL-ACE BBS, (818) 359-1697.

AUTOCAD

AutoCAD Los Angeles Users Group. Meetings fourth Thursday of the month (except November and December—Meetings Nov. 20 and Dec. 18), Church of Religious Science, 260 North Pass Ave, Burbank. Contact Tesfaye Abagaz, (818) 843-5770 (work).

COMMODORE

San Diego Commodore Users Group. Meets third Wednesday, 7 pm, 2557 3rd Ave. (Women's Club), San Diego. For all Commodore machines. Contact Jane Campbell, (619) 584-2872 for more information, or write: P.O. Box 86531, San Diego, CA 92138-6531.

San Fernando Valley Commodore Users Group. Meets second Wednesday of the month at Patrick Henry Junior High on Louise Ave. between Devonshire and San Jose in Granada Hills, near 118/405 freeway interchange. Contact Tom Lynch, 21208 Nashville, Chatsworth, CA 91311, (818) 709-4736.

San Luis Obispo Commodore Computer Club 1766 9th St., Los Osos, CA 93402. (805) 528-7475 BBS.

The Commodore Users Group - San Juan Capistrano. This group of C64 users meets the second Saturday of every month from 9:00 am till 12:00 at Great American Federal Savings and Loan, 32232 Camino Capo, San Juan Capistrano. For info call 496-5745.

Orange County Commodore Technical User's Group C-TUG. Orange County's Commodore user group. Club newsletter, two 300/1200 baud BBSs, door prizes, SIGs in Comal, DOS protection, data bases, wpros, and BASIC. Custom software and ROM chips, and just plain good times. Meetings at Mercury Savings and Loan, 4th and Newport, Tustin, fourth Sunday of the month, 10:30 am. Contact Ellis L. Higham, corresponding secretary, P.O. Box 8342, Orange, CA 92664, (714) 554-9222.

Hollywood User Group (HUG) for Commodore computers. Meets 2nd Saturday of the month at Plummer Park, Conference Room, 7377 Santa Monica Blvd., West LA at 12 noon. Contact HUG BBS (213) 874-8256 (24 hrs) or write HUG, P.O. Box 38313, Hollywood, CA 90038.

Southern California 64 Users Group. Learn more about your Commodore 64. Extensive public domain disk library. Meet at Mid Cities Bank in Gemco shopping center on Bellflower, just south of 91 Freeway, 7 pm, 3rd Tuesday of every month. Contact Joe Allain, 3852 Riverton, Studio City, CA 91604, (818) 985-2647.

C-128 West UG. User group for owners of the Commodore C128, from beginner to advanced; PD software available. New group still assessing the needs and interests of members. Intend to network with other user groups on C128 software. Meetings 2nd Tuesday, 7:15 pm, McKinley School in Santa Monica, Santa Monica Blvd. and Chelsea. Contact Don Campbell (213) 828-9308.

Inland Empire IBM/C64 User Group. Major subjects are local area networks, small business software, data communications. Send SASE for free newsletter with dates and software library. Contact Winfried Hofacker, P.O. Box 988, Chino Ca 91708-0988.

Commodore Creations Users Group (CCUG). We offer library, newsletter, and other services; upcoming BBS; soon to be member of Commodore World. Meets 2nd or 3rd Sunday of each month 2-4 pm. Membership dues $26 per year. Call or write for info: Brian R. Klotz, 1135 Coronet Ave., Pasadena, CA 91107 (818) 351-8198.

Back-Country Commodore Club. Meets first Thursday 7 pm, Ramona Lutheran Church on 14th St. Check us out for relaxed, informative group discussions. We're here to help those with problems and to promote better uses of Commodore 64s, 128s, and Amigas. Contact Gerry White at (619) 789-3209, 511 14th St. #D-13/P.O. Box 373, Ramona, CA 92065. Meetings at 617 16th St., Ramona, CA 92065, 7 pm, 1st Thursday each month.

General Dynamics Commodore Computer Club. Meets third Tuesdays, 4:30 pm, Convair Rec. Assn. room C. Commodore 64 and 128 only. Contact Al Wilson, (619) 429-6790 for information.

C.U.B.E. Commodore Users, Buffs, and Enthusiasts meet first and third Mondays of each month, 7:30 pm, East Side Christian Church, 668 Obispo, Long Beach. Contact Lynn Cothern, 2005 Palo Verde #163, Long Beach, (213) 421-1041 modem.

Com-Pacs. Meetings and/or copies of public domain software and discussion of problems. New computer C64/128 technologies. Sales and swaps of equipment. Meetings at 2354 Elmgrove St. Los Angeles, CA, Saturdays, 3 pm. Contact Lon Damiani, (213) 222-2277.

PLUG (The Plus/4 Users' Group). Dedicated solely to support of the Commodore Plus/4. No regular meetings, 200 members in US, Canada, Mexico, and Europe. Newsletter, public domain software library. P.O. Box 1001, Monterey, CA 93942.

Pacific Computer Club (Commodore). Meetings 391 S. Madison, Pasadena, 2nd Thursday, 7 pm. Contact Norman Sauppe, (818) 792-9840.

FCUG/SixtyFourum. PD library, newlsetter, meeting 3rd Saturdays, 8:30 am. Contact George Bearden, P.O. Box 16098, Fresno, CA 93755, (209) 291-7053. BBS (209) 431-6288.

Central Coast Commodore Users Group. Meets 3rd Tuesday of each month. Contact Gilbert Vela, 4237 Plumeria Ct., Santa Maria, CA 93455. CCCUG BBS (805) 934-2216, 24 hrs/7 days, 300 baud, Punter BBS protocol for downloads.

Diamond Bar User Group (DBUG). The Diamond Bar User Group is dedicated to the Commodore line of computers, C64, C128, and the Amiga. The club has a large public domain software library base, especially Commodore CP/M. Free raffles, technical discussions, software demonstrations, and the monthly freebie disk can be found at most any meeting. Meetings 2nd and 4th Wednesdays, 7 pm, Diamond Bar Library, 1061 S. Grand Ave., Diamond Bar, CA. Contact David Dietzel, (714) 947-1882 for more information.

South Orange County Commodore Programmers and Users (CPU). Meetings at Great American Savings, 23688 El Toro Road, El Toro, third Saturdays, 9 am. Contact Don Gribble, President, 25401 Champlain Rd., Laguna Hills, CA 92653, (714) 830-2430 or (714) 855-8320.

West Orange County Commodore User Group. Meetings 1st Sundays, 1 pm, Mercury Savings, Buena Park, corner of Valley View and Lincoln. Write for info: P.O. Box 6441, Buena Park, CA 90622; or call Mark Stanford, (714) 772-4182 or Art Collins (714) 821-0195.

Bits & Pieces Amiga Group of Anaheim. Meets every Tues-day 6:30-10 pm at 1130-A N. Kraemer Blvd., Anaheim, CA 92806. C-64, C-128, Amiga. Public domain software, technical help, guest speakers, much more. Contact John Callaci or Mike Dalton (714) 630-8644/630-8711 for information.

The Pasadena Commodore Computer Club meets the first and third Wednesday of the month at 7 pm in the Circadian Room of the cafeteria on the campus of Pasadena City Col-lege, SE corner of Colorado and Hill. For more information write to PCCC, P.O. Box 1163, Arcadia, CA 91006, or call (818) 447-2212 after 2:30 Pacific time.

Osborne Komputer Owners Klub (OKOK) is a microcomputer user group serving a variety of computers: Osborne, Kaypro, Commodore C128, IBM and clones. Thus we serve both MS-DOS and CP/M operating systems. We offer monthly meetings, classes, public domain software library, electronic bulletin board and special purchase opportunities. Meetings third Wednesday of the month, 7:00 – 10:00 pm. Meetings held at the Altadena Public Library, 600 E. Mariposa, Altadena, CA. Contact Lionel Soracco, (818) 794-3243, or write OKOK, P.O. Box 40429, Pasadena, CA 91104.

CORDATA

Cordata Users Group. Meets 2nd Fridays, 7 pm. 20630 Lassen St., Chatsworth. Contact Alicia Fahey, (818) 709-6202 for information.

DEC

DECUS Inland Empire PC-LUG Digital Equipment Computer Users Society. Free to all DEC users; Decmates, Rainbows, Professionals; P/D software; guest speakers; software /applications assistance available; FIDO bulletin board. Meets Cal Poly-Pomona campus, Library Bldg 15, Room 12, 7:30 pm 3rd Tuesday of each month. Contact Jan Snyder, 380 Verona St., Upland, CA 91786, (714) 620-7511 ext. 4376.

DECUS Southern California PC-LUG. Digital Equipment Computer Users Society. Free to all DEC users; Decmates, Rainbows, Professionals; P/D software; guest speakers; software/applications assistance available; FIDO bulletin board. Meets 10:30 am, 1st Saturday of the month, Press Telegram Bldg., 3rd Floor, 604 Pine Ave., Long Beach, CA. Contact Bill Davis, 1457 W. 219th St., Torrance, CA 90501. (213) 827-4600.

DECUS Rainbow Pacific PC-LUG Digital Equipment Computer Users Society. Free to all DEC users; Decmates, Rainbows, Professionals; P/D software; guest speakers; software /applications assistance available; FIDO bulletin board. Meetings at Digital Equipment Corporation, 6101 W. Centinela Ave., Culver City, CA 90230, 7 pm, 2nd Wednesday of each month. Contact Don Braums, 3312 Summertime Lane, Culver City, CA 90230, (213) 202-1784.

EASYBUSINESS

Easybusiness Systems Users Group. CPAs, Consultants, and other business people interested in Computer Associates Easybusiness Systems' Accounting Software. For information, contact Gary Robinson (213) 398-6544.

EPSON

Cursor Club Epson 402 W. Arrow Highway, Suite 6, San Dimas, CA 91773. (714) 559-8361, Bulletin Board: (714) 592-6316.

San Fernando Valley Epson User Group. Meetings at Fallbrook Square Community Room "The Meeting Place" off the Food Court in the new Fallbrook Mall, 6633 Fallbrook Ave., Canoga Park, between Victory and Vanowen. Meets 3rd Wednesday of each month at 7 pm. Contact Pat Denslow, (818) 881-4029 for information.

Epson Users Group of Orange County. 6075 Jeffrey Mark St., Cypress, CA 90630, (213) 414-4817.

Epson Users of San Diego. P.O. Box 87448, San Diego, CA 92138, (619) 560-7604.

High Desert Epson Users Group. 933 Cottonwood Drive, Barstow, CA 92311, (619) 256-3541.

PSC/QX. 2934 Wilshire Blvd., Santa Monica, CA 90403, (213) 453-4535, Bulletin Board: (213) 474-4952.

South Bay Epson Users Group. 1115 Cerise Avenue, Torrance, CA 90503, (213) 328-9916, Bulletin Board: (213) 618-1940.

Epson Computer Club of America. Monthly meeting 2nd Saturday of the month at 10 am, Mercury Savings and Loan, Irvine Blvd. one block east of Newport Ave. Messages Epson West Bulletin Board (714) 630-7104 User area B:15. Monthly newsletter "The Help Key." Contact Roy Boorman, 4021 Winterhaven St., Yorba Linda CA 92686, (714) 524-9483.

Epson User's Group of Orange County. Meets on 3rd Saturday of the month from 10 am to 12 noon at 2111 Main Street, Huntington Beach, CA 92648. Contact Richard A. Petersen. 7282 Mast Dr., Huntington Beach, CA 92646. (714) 536-6979.

FORTH

FORTH Interest Group, Los Angeles Chapter. Meets 4th Saturday, 10 am, Hawthorne Public Library, 12700 S. Grevillea, Hawthorne. Contact Phil Wasson (213) 649-1428.

FORTH Interest Group, Orange County Chapter. Meets 1st and 4th Wednesdays, 7 pm. Call Noshir Jesung for info. (714) 842-3032.

FORTH Interest Group, San Diego Chapter. Meets weekly, Thurs., 12 noon, contact Guy Kelly (619) 268-3100 ext. 4784.

HEATH

Los Angeles HUG (Heath Users Group). A support group for users of Heath/Zenith computers. Monthly speakers, software library, information exchange, newsletter. Meetings open to visitors. Meetings at 2309 S. Flower St., LA 90007, first Thursday of each month at 7 pm. Call Tom Davis for information at (213) 462-2642.

LUV-A-HUG Heath /Zenith User's Group. Meets 2nd Thursday of each month, 7pm, at Heath /Zenith Computers and Electronics, 22504 Ventura Blvd. Woodland Hills, CA 91364. A users group dedicated mainly to the Heath/Zenith line of computers, but anyone interested in computing is welcome. Dues are $12/yr, which includes group newsletter and copying of public-domain software from extensive library of PC-, Z-100, and CP/M compatible software. For more info contact John Rotondi, between 10:00 am and 6:00 pm at (213) 874-9344. BBS (818) 772-0384.

HEWLETT-PACKARD

Club of Hewlett - Packard Hand-Held Users (CHHU). HP handheld users worldwide support CHHU as a noncommercial, open, independent club dedicated to applying today's machines and making a contribution to the true personal computer of tomorrow. Send SASE for more info to Richard J. Nelson, 2545 W. Camden Place, Santa Ana, CA 92704, or call (714) 754-7757 for meeting directions.

LA-SCRUG. Hewlett - Packard Series 100 business computer user group. Demonstrations and seminars on HP software and equipment. Meetings at 5161 Lankershim Blvd., North Hollywood, 7-9 pm, 2nd or 3rd Thursday of the month. Contact Dave Mark, P.O. Box 60975, Pasadena, CA 91106, (818) 794-4969.

IBM

The Greater South Bay IBM PC Users Association. Any L.A. area PC or compatible owners are welcome to attend these meetings at the TRW cafeteria on Compton Blvd. Meeting time is 7:00 pm on the third Thursday of each month. For info call (213) 398-8153.

Technical Users Group (TUG-NET). For CP/M & MS-DOS PC users. Meets on the first Thursday of each month at 7:00 pm. Valley Plaza Park, Community Room, 12240 Archwood St., North Hollywood, CA. Contact Mike Faith - (818) 994-6567. DOS SIG meets 3rd Mondays, 7 pm, Sears S&L, Van Nuys. Call (818) 701-0512 for information. BBS (818) 882-6045.

UCLA PC Users Group. IBM PC or compatibles owners welcome to join us on the 2nd Tuesday of the month, 7 pm. Public domain library , SIGs, BBS, seminars and newsletters. NPI Auditorium, UCLA, Westwood Plaza, Level C. For more information call (213) 473-6668.

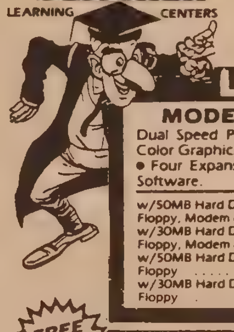
Pasadena IBM User's Group. Meets 3rd Wednesday of each month at Cal Tech, Steele Building, Room 102. For more info send SASE to Steve Bass, 711 E. Walnut Street #306, Pasadena, CA 91101, (818) 795-2300.

Inland Empire IBM/C64 User Group. Major subjects are local area networks, small business software, data communications. Send SASE for free newsletter with dates and software library. Contact Winfried Hofacker, P.O. Box 988, Chino Ca 91708-0988.

The Foothill Computer Club. An IBM-PC users group. CCCUG — Crescenta-Canada-Compatible Users Group. P.O. Box 1265, La Canada, CA 91011, (818) 790-6672. Meetings 1st Wednesday of the month at 6:30 pm at the Glendale Federal Bank, 2350 Honolulu, Montrose, CA. For newsletter send SASE to above address.

NOCCC Lotus & Business SIG. Subgroup of North Orange County Computer Club. Meets first Sundays at Chapman College in Orange, CA, 11:15 am. Lotus 1-2-3 and business application demos, speakers. Call to verify dates, address: Vance Joachim, (714) 998-8080. P.O. Box 3616, Orange, CA 92665.

The Riverside IBM Computer Club. Meetings at Computerland Riverside, Monday 7 pm. We specialize in software demonstrations, sharing of public



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Orange Coast IBM PC User Group. A not-for-profit organization open to anyone with or considering the purchase of an IBM PC or compatible computer. Monthly meetings, usually on the last Saturday of the month, consist of one or two guest speakers, a short business session and a period for random access. OCIPUG has public domain and user supported software, a monthly newsletter and a bulletin board. Membership is $20 per year. Meetings at Orange Coast College, Science Hall, Costa Mesa, last Saturday of the month, 9 am–12 noon. Contact Tom Sutro, P.O. Box 6100-211, Costa Mesa, CA 92628, (714) 850-0474.

Valley Computer Club. IBM PC Users Group meets first Wednesday each month. The group is part of Southern California's original computer club. Its purpose is to distribute public domain software and exchange info on the PC. Meetings at 2006 W. Magnolia Blvd., Burbank, 7 pm. Contact Sy Lieberman, (818) 981-9593.

Kern Independent PC User Group (KIPUG). Meets the 2nd Thursday of each month beginning at 7 pm at the County Superintendent of Schools Boardroom, 5801 Sundale Ave., Bakersfield. Contact Jim Harrer, P.O. Box 2780, Bakersfield, CA 93303, (805) 395-0223.

Bits & Pieces IBM of Orange County. Meets at 1130-A N. Kraemer Blvd., Anaheim, every Saturday at 10 am. Call John, (714) 630-8644 for more information.

Ventura Personal Computer User's Group. All MS-DOS and PC-DOS machines. Meetings 3rd Saturday 9 am-12 noon, Foster Library, 651 E. Main, Ventura. contact Mike Regan, President, 301 Dana Point, Ventura, CA 93004, (805) 647-8273.

Thousand Oaks Personal Computer Club (TOPCC). Meets fourth Thursday, except November and December (3rd Thursday), at CAL Lutheran Univ., 60 W. Olson Road, Thousand Oaks. 6:30 pm beginners, 7:30 regulars. Group is five years old and has approximately 150 members. Contact Bob Tracy, (805) 482-7092 for more information. BBS: (805) 499-8378.

Southwest PC Users Group. All computer users are welcome. Meetings 3rd Saturday of each month; call for meeting place. Christine Tripp, (213) 935-4105.

Tulare County PC. Meetings at Genesis Computers, 3rd Thursday each month. Call Roger Jenan, (209) 733-8204 for information.

Claremont Computer Club. This club is for any interested IBM PC or compatible users. Meetings start at 7:30 pm on the 3rd Monday of the month. Call (714) 626-2268 for meeting location and information.

Apple/Valley Computer Club. Member interests include Apple, Amiga, IBM and others. Meetings are held on the 2nd Wednesday of each month, 7:30pm, at Valley Presbyterian Hospital, meeting room #3, 15107 Van Owen, Van Nuys, CA. For more info, contact Dr. William H. Trent, 6502 Kester Avenue, #7, Van Nuys, CA 91411, (818) 988-1752.

Osborne Komputer Owners Klub (OKOK) is a microcomputer user group serving a variety of computers: Osborne, Kaypro, Commodore C128, IBM and clones. Thus we serve both MS-DOS and CP/M operating systems. We offer monthly meetings, classes, public domain software library, electronic bulletin board and special purchase opportunities. Meetings third Wednesday of the month, 7:00 –10:00 pm. Meetings held at the Altadena Public Library, 600 E. Mariposa, Altadena, CA. Contact Lionel Soracco, (818) 794-3243, or write OKOK, P.O. Box 40429, Pasadena, CA 91104.

KAYPRO

Lakewood/Long Beach KUG is a group of Kaypro computer owners dedicated to helping each other solve problems and share information and public domain software. The meeting is open to all. Meetings at Midcities Bank, 9025 Artesia, Bellflower, CA, 2nd Wednesday of each month; 7 p.m. Contact Melvin Pasley, 4566 Shadeway Rd., Lakewood, CA 90713, (213) 421-3094.

Kaypro UG, 3134 N. Palm Shields, Fresno, CA 93704.

K-West, Orange County Kaypro users group. Meetings 2nd Monday of the month, Glendale Federal Savings, 100 Newport Center Drive, Newport Beach.

Club 16. Meets once a month in Costa Mesa at 2790 Harbor Blvd., (CBS Store) to share knowledge of the 16 bit world. It is a small group so that everyone can get to know each other and share. Large public domain library. Contact Peggy Lloyd, (714) 645-9868 for information.

LA Kaypro Users' Group. Primarily CP/M users, all brands welcome. Meets 3rd Tuesday, 6:30-9:30, Beverly Hills High School, 241 Moreno Ave., 3rd floor cafeteria, near Olympic and Spalding. Contact Allyn Franklin or Barry Cole, (213) 278-3748 or (213) 390-3851 after 11 am please.

Kayos Kaypro Users Group. Kayos Kaypro User Group invites Kaypro and CP/M users to meetings at TRW in Redondo Beach, 6:30 pm, third Monday of the month. (213) 379-8339 for details.

TUG-NET Kaypro and Osborne SIG meets 4th Thursdays, 7 pm, Central Savings, 4464 Van Nuys Blvd., Sherman Oaks. Call (818) 882-1693 for information.

Osborne Komputer Owners Klub (OKOK) is a microcomputer user group serving a variety of computers: Osborne, Kaypro, Commodore C128, IBM and clones. Thus we serve both MS-DOS and CP/M operating systems. We offer monthly meetings, classes, public domain software library, electronic bulletin board and special purchase opportunities. Meetings third Wednesday of the month, 7:00 –10:00 pm. Meetings held at the Altadena Public Library, 600 E. Mariposa, Altadena, CA. Contact Lionel Soracco, (818) 794-3243, or write OKOK, P.O. Box 40429, Pasadena, CA 91104.

LEADING EDGE

Leading Edge User's Group. A user's group of predominantly Leading Edge users and other similar machines with high clock speed. Public domain software, demos of software/hardware. No fees. Meetings 7:00 pm, 2nd Wednesday of the month, 12792 Valley View, Suite F, Garden Grove, Contact Bruce Fruchter, (714) 891-2001 for information.

OCTIPUG-SIG. Forming Leading Edge user's group. Will organize to teach DOS, Framework, dBASE III, utilities and public domain software. Meeting times and address to be announced. Contact Michael Banyacki, 24992 Spadra Lane, Mission Viego, CA. (714) 770-3172. Leave name and phone number.

LOTUS

Los Angeles Lotus Users Group. Demonstrations, problem-solving, third-party applications, etc. For Lotus 1-2-3 and Symphony. Informal and fun. 7–9 pm, Burbank church of Religious Science, 3rd Thursday each month. Take 134E to Pass, N. 1 block. Call Don Roark, President, (818) 905-1441 for information.

MACINTOSH

Los Angeles Macintosh Group (LAMG) Be a part of the best Mac group in So. Calif. Many SIG and local groups to choose from including desktop publishing, OMNI, business, education and more. Monthly main meeting at McKinley Elementary School, Santa Monica Blvd. at Cloverfield, Santa Monica. Membership $25 annually includes 12 issues of MacDigest newsletter, access to public domain library, discounts at local stores. Call Eric Anderson, (213) 278-LAMG for information.

Ventura County Macintosh Club Mac and Lisa users invited. Membership $21/yr.; newsletter, software library, discussions and ideas. P.O. Box 7754, Oxnard, CA 93031, (805) 983-1610, (805) 499-2824.

Mac Valley Users Group. For $20/yr. membership fee you too can enjoy meetings chock full of software/hardware presentations, public domain software library, Mac articles index, software and accessory raffles, and help hotline. Broad range of users, very friendly to novices. Meetings at Burbank High School Cafeteria, Burbank Blvd. at 3rd St., Burbank, CA, third Tuesday of the month, 7:30 p.m. Contact Ruth Stever, P.O. Box 4297, Burbank, Ca 91503, (818) 848-1277.

MAC-HACers. Macintosh computer club for Hughes Aircraft employees only. Meetings 3rd Wed. each month, H.E.S.E.A. Club House, 1216 Imperial, El Segundo, CA 90745, across from LAX, 5 pm. Contact Bud Grove, (213) 606-2212, 5am-3pm, (213) 549-9664.

Orange Apple Macintosh Group. The Macintosh Meeting of the Orange Apple Computer Club meets 1 pm-4 pm the 1st Saturday of each month in the Science Hall at Orange Coast College, Costa Mesa. We have the best of the public domain software for the Mac, and several fun special interest groups which include Fast Start, Mac Modem, and Deciphering Mac Public Domain. For further info, call (714) 770-1865.

Mac Orange. Monthly newsletter, special intrest groups, monthly meetings, $20 annual dues. Meetings 3rd Wednesday of each month, 7:30 pm, Johnson Center, Santa Ana College, Bristol at 17th. Novices SIG meets at 7:00. For info write Box 1830, Santa Ana, CA 92701, or call (714) 542-9753.

MacBuddhist. Learn about computer assisted dharma study and application to daily living. Network of on-line Bodhisattvas sharing material crossing sectarian lines. Monthly meetings, last Saturday of the month. Contact secretary, College of Buddhist Studies, 933 South New Hampshire, Los Angeles, CA (213) 739-1270.

Corporate User Groups SIG of Los Angeles Macintosh User Group establishes communication between leaders of Macintosh User Groups of companies in the greater Los Angeles area. The main purpose of the group is to share information on Macintosh use in corporations. It also consults company recreation clubs in starting and supporting company Macintosh groups. Contact Charles Shipp, (213) 970-6300w, (213) 833-9186h, for more information.

San Gabriel Valley Mac Users Group. Meets once a month to disseminate information about the Macintosh. Meetings are held on the first Thursday of every month at the City of Hope in Duarte, 7:30 pm in cafeteria complex Room B. The SGVMUG has special interest groups such as Power Users' SIG and a Novice SIG. Public domain library, monthly newsletter. Membership is $20 per year. Contact Frank Chavez on the 24 hour information line (213) MUG-ICON, or write SGVMUG, P.O. Box 792, Sierra Madre, CA 91024.

Macintosh Computer Society. General meeting on the 1st Thursday of each month at 23 Civic Center Drive, Northwest corner of Santa Ana Blvd. and Rose Street. Meeting time 7:30 pm. Membership $20.00 per year. FREE help / education meetings on the 2nd and 3rd Tuesday of each month at

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Rockwell International Macintosh Users' Group (RIMUG). Meets 1st Tuesday of each month 12 noon at 2770 E. Carson St., Lakewood, CA. Al Nercessian, president. 8511 Beverly Pk. Pl., Pico Rivera, CA 90660. (213) 420-4819.

MORROW

West LA Morrow User's Group /The Morrow Minority. 40 dedicated members, with special emphasis in WP; PD library. No dues, but $1 at door to pay for refreshments. Some classes and informal newsletter. If new, call to reserve space: Dr. Bernice Ennis, (213) 276-9096, 1833 Franklin Canyon Dr., Beverly Hills, CA. Meetings 2nd Wednesday of the month.

LA Morrow User Group. Meets 3rd Thursday each month, North Hollywood Recreation Center, 11430 Chandler Blvd., North Hollywood. Contact Jack Byers, (818) 347-7283 for information.

NEC

Orange County NEC Users Group (OCNUG). Dedicated to NEC-APC computers, CP/M-86 & MS-DOS. Always room for any experience level. Meets 3 pm, third Saturday of the month. 6642 Lenore, Garden Grove. CA 92645. Call John Bingel at (714) 897-7656 for more info.

The Los Angeles Area NEC APC Users Group meets on the first Saturday of each month at 3 pm at the I/O Interface Computer Mart, 6241 West 89th St., Los Angeles, CA 90045. Telephone (213) 410-9824. There is no meeting in January, and occasionally a meeting may be cancelled or postponed, so it is best to call before coming.

OLIVETTI

Olivetti PC User Group forming. Send SASE to Stan Cory, 29500 Heathercliff Rd. #86, Malibu, CA 90265, or call (213). 457-3879.

OMNIS 3

Omnis 3 User Group. Meets every third Wednesday of the month at Grant St. Elementary School in the auditorium. Address is 2368 Pearl St., Santa Monica. Time is 7:30 pm. The use of Omnis3 and Omnis 3+ in data processing information management systems is covered, from setup to advanced features. Expert and novice welcome. Call Zachary Sempers at (818) 701-1355 for information.

OPEN SYSTEMS ACCOUNTING

OSAS User Group. New group being formed for CPA's, consultants, and other business people who use Open Systems Accounting software to promote a better understanding and more efficient use of OSAS software. Subjects covered will include use of DOS, general accounting and the general use of software and hardware, e.g. networks.

OSBORNE

TUG-NET Kaypro and Osborne SIG meets 4th Thursdays, 7 pm, Central Savings, 4464 Van Nuys Blvd., Sherman Oaks. BBS (818) 882-6045, 8-N-1, 1200 baud, 24 hours.

Osborne Komputer Owners Klub (OKOK) is a microcomputer user group serving a variety of computers: Osborne, Kaypro, Commodore C128, IBM and clones. As an affiliate of FOG, we serve both MS-DOS and CP/M operating systems. We offer monthly meetings, classes, public domain software library, electronic bulletin board and special purchase opportunities. Meetings third Wednesday of the month, 7:00–10:00 pm. Meetings held at the Altadena Public Library, 600 E. Mariposa, Altadena, CA. Contact Lionel Soracco, (818) 794-3243, or write OKOK, P.O. Box 40429, Pasadena, CA 91104.

Osborne National Users Group meets 2nd Fri./mo. at 7:30 pm at Wizard of Oz, 20630 Lassen St., Chatsworth, CA 91311. Contact Art Schlefstein, (818) 709-6969.

PARADOX

Southern California Paradox Users Group. Anyone with an interest in the relational database Paradox please send an SASE to Brian Smith, 350 Palos Verdes Blvd., Redondo Beach, CA 90277. Meetings are being held in LA and Orange County.

RADIO SHACK/TRS

South Bay Color Computer Club TRS-80, TDP-100, Dragon. Meets third Friday of the month at Mercury Savings, 22939 Hawthorne Blvd., Torrance. Info: Andrew Corlett, 1435 W. 172nd St., Gardena, CA 90247. (213) 538-8394.

OCTUG-Orange County TRS-80 Users Group. Meets the 3rd Sunday of each month in the community room at "The City Shopping Center". in Orange. The room is near the green entrance of the mall (N.E. corner). MS-DOS SIG (Special Interest Group) begins at 11:30 am. General meeting begins at 1:30 pm. Devoted to the Tandy line of computers and compatibles. Come on down and see what it's like. For more info, contact Franco Collino, (714) 750-0887.

San Gabriel Valley TRS-80 Users Group. Supporting users of TRS-80 and Tandy computers. Meets 2nd Friday of each month at Arcadia Park Senior Citizens Center at 7:30 p.m. Monthly newsletter, various SIGs, lotsa fun & info. Contact Dan Dresselhaus. (818) 914-5831 days.

VTUG (Valley TRS-80 User Group). Devoted to users of TRS-80 Model I, II, 4, 4P, LNN or MAX-80. Speakers, presentations, raffle drawing, refreshments. No admission or membership fee, new members welcome. Meetings at Glendale Federal Savings, 7129 Topanga Canyon Blvd., Canoga Park, 3rd Thurs., 7:30 pm. Contact Fred Blechman, (818) 346-7024.

VTHGValley TRS80 Hacker's Group. Programming and problem solving for Models 1, 3, and 4. No vendors, no machines. No dues. No sweat. Bring a blank disk and get NEW public domain software. Meetings 1st Fridays, 7:30 pm, Valley Plaza Park Auditorium, 12240 Archwood St., North Hollywood. Call Eric Bagai at (818) 982-0467 for more information.

Tandy 1000 (The MUG) Meets fourth Wednesdays, 7 pm, 9027 E. Artesia, Bellflower, CA. Contact Dick Sherwood, 4014 Centralia St., Lakewood, 90712, (213) 421-4014. The MUG RBBS (213) 425-0022, members only.

Color America. Radio Shack color Computer SIG meets 2:30-5 pm on the third Saturday of the month at Rosemead Community Center, 3936 N. Muscatel Ave., Rosemead. Contact Mark Randall, 2227 Canyon Rd., Arcadia, CA 91006, (818) 355-6111.

The Los Angeles-Wilshire Color Computer Users' Group, a TRS-80 Color Computer Users' Group, meets the 2nd Saturday of each month, 12:30 pm-5:30 pm in the Felipe de Neve library's community room, 2820 W. 6th, Los Angeles. Call Milton, (213) 558-4909.

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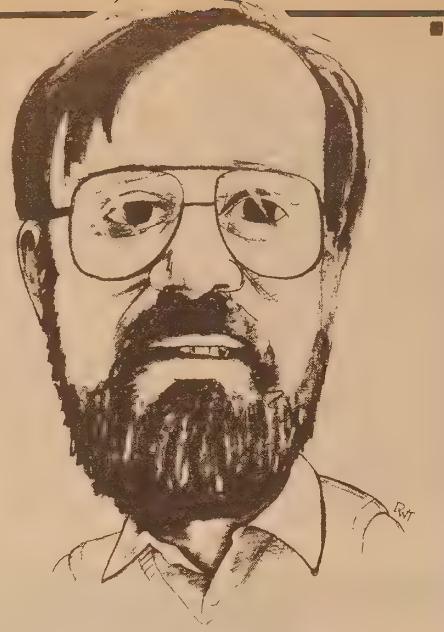

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The Orange County SBT Users Group is being formed and is seeking members who are interested in an atmosphere that promotes the better understanding and more efficient use of the SBT Accounting Software. Contact Jay Rubin, P.O. Box 5145, Newport Beach, CA 92662, (714) 720-8171.

United Computer Federation-Orange County Chapter. Meets the second Sunday of each month at the Mercury Savings building on Edinger Ave., 1 block north of Beach Blvd. in Westminster. Meeting starts at 1:30 pm. Meetings are open to the public and all are welcome. The UCF is a network of Tandy Color Computer user groups. For more information phone Allen Nedrow, chapter president, at (213) 692-3073.

United Computer Federation-San Fernando Valley Chapter. Meets the fourth Tuesday of each month at the Tarzana Radio Shack, 18545 Ventura Blvd., 1/2 block west of Reseda Blvd. Meeting starts at 7:30 pm. Meetings are open to the public and all are welcome. The UCF is a network of Tandy Color Computer user groups. For more information phone Pete Ellison, chapter president, at (818) 840-8902.

United Computer Federation-Los Angeles Chapter. Meets the fourth Thursday of each month at the Church of Christ recreational building, corner of Clark and Park streets, just off the 91 freeway in Bellflower. Meeting starts at 7:30 pm. Meetings are open to the public and all are welcome. The UCF is a network of Tandy Color Computer user groups.

SANYO

Sanyo-MS/DOS Table Top Computers, 14717 South Prairie Ave., Lawndale, CA 90260. (213) 679-1151.

Zenith-Sanyo Users Group meets 10 am every first and third Sunday at 401 S. La Brea Ave., Inglewood, CA 90301. Call Alan Gillen, (213) 674-0318 for information.

Sanyo Users Group of LA (SUGLA). Devoted to users of Sanyo MBC 550/555 micro business computer. Guests welcome. Dues $15/yr. Speakers, presentations, public domain software library, information, new hardware and software reviews. Meetings 2nd Wednesdays, 7 pm, CAL State University, LA, Student Union (Bldg. #5), 4th floor in South Pasadena Room. Contact Fred Blechman, (818) 346-7024.

TEXAS INSTRUMENTS

LA 99er Computer Group. TI 99/4A support, classes and SIGs, large software library, monthly newsletter. Demonstrations, bulk purchase discounts on hardware, software and books. A good group to join. Meetings at Torrance Public Library, 3301 Torrance Blvd. (corner of Madrone), Torrance, CA. 4th Wednesday of the month, 7 pm. Contact Terrie Masters, 148 S. Maple Drive, Beverly Hills, CA 90212, (213) 271-6930.

The TI-99 Club. Yes, there still are a lot of 99's and 99/4a's around. If you own one, then get in touch with these people. They have good info for TI owners. Meetings take place at the Westminster Community Center on the third Thursday of every month at 7:00 pm. For info, call (714) 842-0859.

TI-West (Los Angeles West Side Area). Meets at DeCoursey Engineering Laboratory, 11828 W. Jefferson Blvd., Culver City, on the 3rd Monday of each month. For information, contact Lew Howard at (213)397-9668.

San Gabriel Valley TI 99/4 Users Group meets 1st Wed./mo. at 6:30 pm in the Covina Parkway, West Covina, CA. Contact Tom Padilla, (213) 330-8240.

TI Riverside UG. Supporting the TI 99/4A. Meetings at Collett School, 3rd Thursday, 7 p.m. Contact Ed Butcher, 3523 McKinley St., Riverside, (714) 686-0336.

San Fernando Valley TI 99/4A User Group. Library, Workshops, Newsletter, How To? For further information call Jim Edwards, (818) 248-9558, 5-10 pm. Meetings 2nd Wednesday of the month, 7:30 pm, Doctor's Conference Room, Sherman Oaks Community Hospital, 4929 Van Nuys Blvd.

Antelope Valley TI UG. TI User Group. Meetings at Palmdale Culture Center, 3rd Wed., 7 pm. Contact Len Rouw, 38540 26th St. East, (805) 947-6270.

El Toro 99 Home Computer Users Group. The ET-99 Home Computer User Group meets to demonstrate programs, equipment, and discuss techniques. Contact Ken Baldwin, 23065 Sonoita, Mission Viejo, CA 92641, (714) 855-0480. Meetings at Mercury Savings and Loan, 1-5 and Lake Forest, El Toro, 2nd Saturday of each month 9 am - 12 noon.

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BUG (Brea 99er's Users Group). Meets the first Monday of the month at 7:30 pm at the Western Federal Savings meeting room, #10 La Habra Fashion Square, corner Beach and Imperial, in La Habra. For further information call Bob August at (714) 871-3405.

San Fernando Valley Texas Instruments Professional Computer User Group (SFV TI-PRO USER GROUP). Meets at 9017 Reseda Blvd. Suite #212, Northridge, on the 3rd Sunday of each month at 10:00 am. We serve the entire San Fernando and Santa Clara Valleys. Group meets to discuss: how-to techniques, programs, equipment and software. All are welcome —bring a friend. TI-Pro/AutoCAD Users are also welcome. For more info, contact Marcus Swed at (818) 993-3151 during the day and at (818) 366-0886 evenings.

TIMEX-SINCLAIR

Timex-Sinclair. South Bay and West Side groups. Call John W. Petersen at (213) 545-9581 anytime or Dr. George Kuby (213) 201-2014 after 3 pm for more information.

TOMY

Tomy Tutor computer user group. Contact Eugene C. Dinovo, P.O. Box 37, Sepulveda, CA 91343.

VICTOR

West Los Angeles Victor Users Group (WLA-VUG). Victor 9000 users - you are not alone! Meet other users. Free V9000 software & purchasing discounts for members. Victor-specific bulletin board (818) 989-2216. Meetings at 8651 Olin St., LA 90034, 7 pm, 3rd Thursday, every month except December. Contact Roger Goodman, (213) 558-8363.

Orange County Victor 9000 User Group. Meets second Friday of the month at 7:30 pm, Cal State Long Beach, Palo Verde St., Engineering Bldg. #2, Room 304, Long Beach. For information write or call Don Henderson, 9350 Bolsa Ave. #8, Westminster, CA 92683, (714) 894-0073.

WANG

Wang WP Users Group. Meets 4th Thurs. of each odd month, 6 pm. Newsletter, speakers, information network. Call for meeting place: Steven Hirsh, (213) 255-5515, or write 2858 El Roble Drive., Los Angeles 90041.

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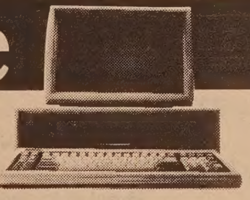

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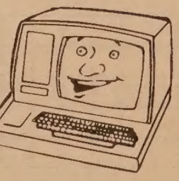

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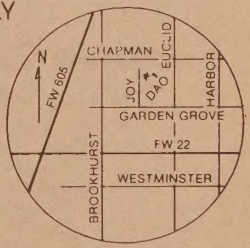

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Intelligent AT 12 Mhz $1349
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What a system! Anchored by the sleek, new AST Premium/286 (6-8 10 Mhz with 0 wait states, 512K, 1.2 Mb floppy, clock/calendar, MS-DOS 3.2) Supercharged with a Seagate 30 Mb. Warp Hard Disk. And displayed on the super hi-res 19" Laserview monitor by Sigma Designs with 1664 x 1200 pixel resolution and true WYSIWYG.

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For stations, we have chosen the versatile PC II XT-compatible computers running at 4.77-8-10 Mhz (also available separately — a great buy!). The PCII comes with 256K expandable to 640K and one floppy disk drive. All three computers come with MS-DOS 3.2, Hercules-compatible mono graphics card and 12" monitor.

Next, we add Novell's 286 G Net. Novell invented the file server and continues to be the undisputed industry leader with more than 4,000 users world wide.

Finally, there's the incredible network accounting package by Computer Associates, EasyPlus Network Manager. We start you off with G/L and A/R, but we're pretty certain you're going to want to add their other modules too, including A/P, order entry, inventory and payroll.

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COMPLETE SYSTEM $7199!
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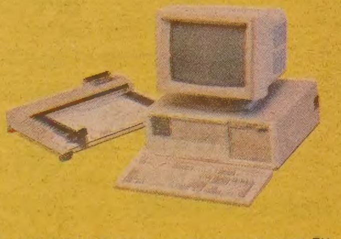

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(Sug. Retail: $1599)

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TURBO 720K™ $159
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